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AUTOMOTIVE INDUSTRIES

NUMBER ONE IN THE INDUSTRY SINCE 1895

TRUCK & OFF-HIGHWAY

Tomorrow's New Car Buyers Surveyed

ARE AUTOMAKERS ON TARGET?

One Man's Vision:

Chrysler's Sterling Plant

Inside Japan No. 4

Getting Serious About Machining Centers

JOS MC NALLY, SRI ACO EDITOR
CONGRESSIONAL INFO SERVICE (COPY #1)
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AUTOMOTIVE INDUSTRIES

November, 1984/Volume 164, Number 11

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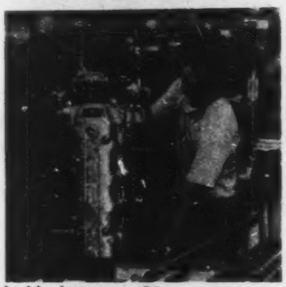

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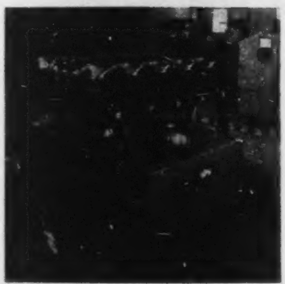

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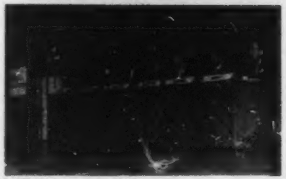

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QUOTABLE

"No thanks, that's really not my style. If you guys did it, I wouldn't get any satisfaction out of it. If I'm going to get violent, I'd want to break his legs myself."—Lee Iacocca, responding to an anonymous, telephoned offer of physical retribution against Henry Ford, after Ford's firing of Iacocca in 1978. A Ford spokesman had told a Detroit newspaper that Iacocca was fired because "the son of an immigrant born in Allentown, PA, is a long way from Grosse Pointe." Exerpted from the new book "Iacocca, An Autobiography," by Lee Iacocca and William Novak, Bantam Books.

"Do you know what would happen if I sent some young engineers over to GM to learn? They would come back spoiled! For every bit of test equipment we have, they have 15. For every instrument, they have 25 computers!"—Dr. Fritz Naumann, director of vehicle testing, Audi AG.

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Tomorrow's New Car Buyers Surveyed

ARE AUTOMAKERS ON TARGET?

AI's exclusive survey of future new car buyers reveals what today's 18 to 30 year olds like and dislike about the current crop of cars, options, safety features and prices.

by Lindsay Brooke and
Jennifer G. Mintzer

When the world's automotive marketeers look down the road at their future customers, what trends do they see? *AI* recently surveyed a random sample of 18 to 30 year old Americans to find out what makes of cars, kinds of options, and special features will be whetting the collective appetite of this segment of the buying public over the next three years and beyond.

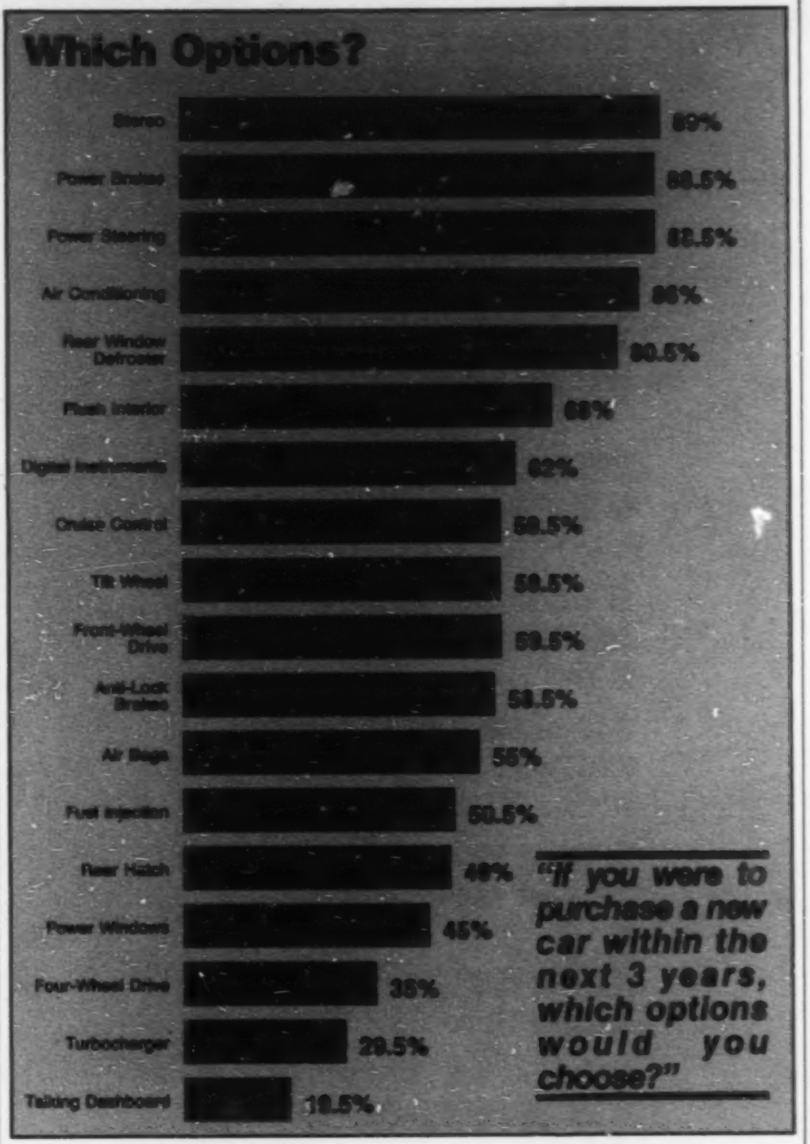
Plus, we asked some of the nation's foremost marketing firms for their interpretations of the data. You may be surprised by the results.

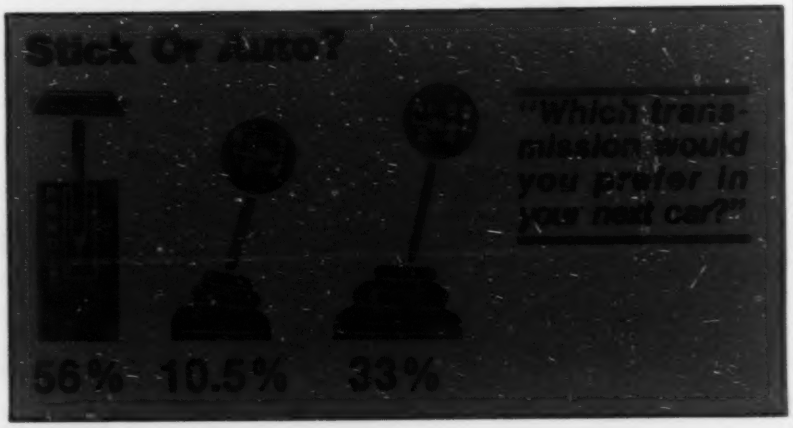
Who's On First?

Not surprising, however, is General Motors hitting the jackpot in our preference study: by totaling all its divisions, the company was a hit with nearly half of all 18-30 year olds surveyed. (See chart, "Which Make?")

Our survey further showed that men and women clearly differ in many of their automotive tastes. The sexes agreed on the first two choices of which car they would buy, but there the similarity ended. After Chevrolet and Ford, women ranked their choices in this order: Datsun (9.2%); Toyota (8.2%); Olds (6.1%); Pontiac (4.1%). Men preferred, starting with third place, Buick (6.9%); Toyota (5.9%); Pontiac and Honda (tied at 4.9%).

Vehicle makes aside, what kinds of extras do the different genders want? (See chart "Which Options?") As expected, the favorite extra was a stereo, reaping 93.9% of the women queried versus 84.3% of men. Only slightly behind in importance are power steering, power brakes, air conditioning and rear window defrosters. Power brakes were the No.1 "goodie" de-





sired by men; 92.2% of our male respondents want it above other options.

Give Me A Six

Perhaps reflecting the trend towards more performance in today's driving, nearly half those surveyed want a six-cylinder engine; the rest are divided almost equally between fours and V8s. After the first place six-cylinder, women prefer the four to the V8, while men are just the opposite.

Americans continue to want their car's transmission to take care of the gear shifting chores—but the popularity of manual gearboxes is increasing. More than half of those surveyed will buy a car with an automatic transmission. Another third want a five-speed. Again the genders split: half the males and nearly two-thirds of the females want automatics; another 41% of males want five speeds, while only a quarter of the females do.

Ergonomics and comfort ranked high in importance to about two thirds of our respondents, who want digital dashboards, plush interiors and tilt-wheel steering in their new cars. However, talking dashboards—the current rage among some auto manufacturers—were deemed important by only about a fifth of our overall respondents, and were only slightly more desirable among women than men.

Front wheel drive and fuel injection are on more than half of our respondents' "want" lists. Over two-thirds of the women surveyed will shop for an fwd car, while a little more than half of the men will. Turbocharging gets the nod from only 30% of our total survey. Half of our respondents will be buying a hatchback, custom-look wheels and whitewall tires.

Reliability is the most important reason for buying a new car to 94% of those surveyed. Following closely was safety (83%) and then handling (81%). Next came fuel economy (73%), price (72%) and ease of service (71.5%). According to our survey, women were distinctly more concerned with price and fuel economy than were men; the cost of a new vehicle being an important buying factor to 22% more women than men.

Peterson: Mini-Car Market to Boom

AI also talked with George Peterson, director of automotive programs at JD Power & Associates, about this group's car purchase decision.

According to Peterson, the decision is primarily based on price. "What you're finding is that many of these people are making their first car purchase, whether it's new or used. If their income is below $30,000 per year, they're out of the new car market. The median income for new car purchasers is over $36,000 a year.

"The key is: when do these people make this transition from buying used to new cars? Manufacturers do not have a tremendous number of makes available in the price range this age group can afford," says Peterson.

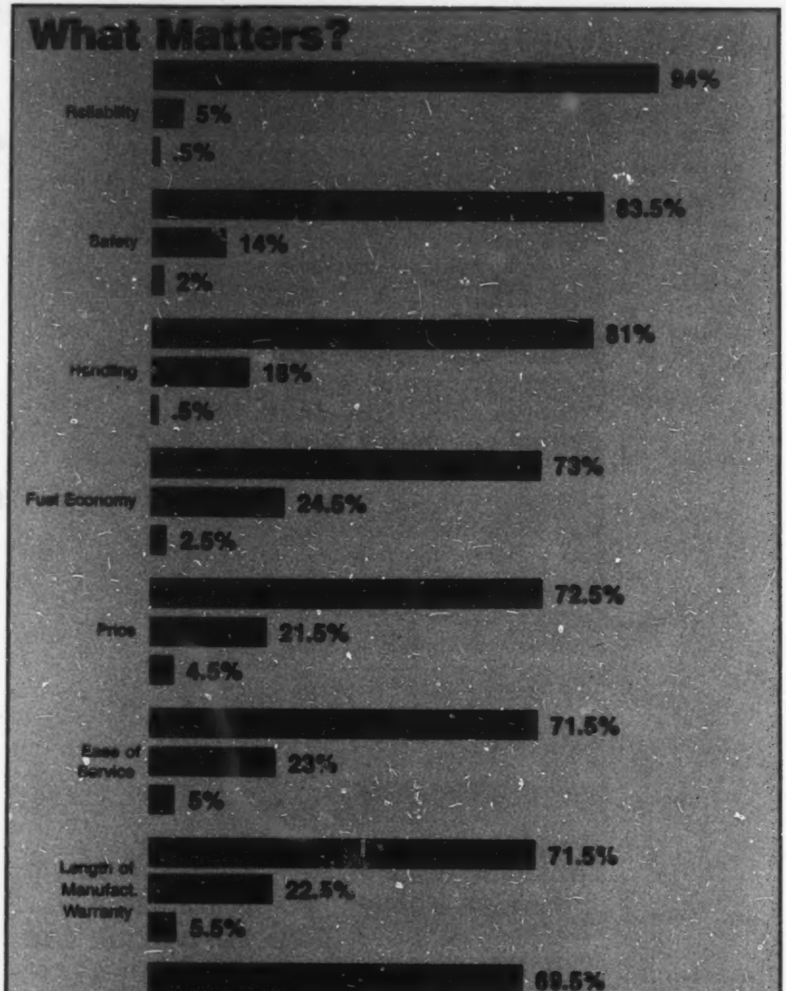
"The first manufacturers with low-priced cars will best penetrate this market. We see them coming from Japan, Mexico and Spain.

"We see the mini-car market booming. The base retail price for a mini-car should be $4500-4700," says Peterson. He feels the Chevrolet Sprint should be in this price range. "We feel the Chevy Sprint has been artificially priced too high because they don't have enough to sell," continues Peterson. "When the supply catches up, we think the price will fall to this range."

AI asked this 18—30 age group if they would be interested in purchasing a mini-car that gets about 50 mpg and costs about $5000. Over half of our respondents said yes and another 8% wanted more information. In this category more females (about two-thirds of those questioned) than males expressed interest, reflecting again the significantly greater preference women have for fuel-efficiency than do men, according to the survey.

Peterson maintains that some features are important to not just this age group, but to all auto purchasers across the board. "If you list the importance of certain purchase motivators, reliability and dependability are number one. Purchase price is number two or three. Fuel economy is usually number three or four. Quality

(Continued)



Teenagers: A Gold Mine Market For The Mini-Car?

What about the 27 million American teenagers: do they pack an influential punch on the automotive market? No, says John Hemphill, VP of marketing analysis at JD Power & Associates. "Teenagers have very little influence on new car buying. Less than 1% of new car purchasers are teenagers—that is teenagers who would purchase the car and register it in their own names. Only 5% of 1984 car purchasers are under the age of 25. And precious few are buying new," Hemphill says.

But others disagree. While the number of teenagers in America has declined by 4 million since 1975, "Higher per capita spending is more than compensating for the numerical decline," says Lester Rand, president of the Youth Research Organization, which annually surveys teenage monetary trends.

"Teenagers have increased their personal spending and extended their influence over family and household purchases," says Rand. "Twenty years ago only one out of three teens urged parents to buy products for the home and family. More than two out of three are doing so today."

Among the top four products influenced by teens is the car. According to Rand, "Fifty-four percent of all teens say they are involved in urging parents to buy cars or suggesting what to buy. In addition, 30% of all teens age 16-19 owned a car in 1983."

According to Grady Hauser at Teen-Age Research Unlimited, "3.7% of American teens currently own a new car. In other words, about one million teenagers own new cars. In the next 12 months, our most recent data shows, 1.75 million teenagers say they will buy a new car—either an '85 model or closeout on the '84 model year."

Hauser claims, "Teens as a group are a significant market and are probably going to dispose of $35 billion in the next year."

What are teens looking for in new cars? "Price is the number one priority for teens," states Power's Hemphill. "Affordability is at the top. Performance and styling are more important to them than to other age groups. They are less concerned with safety, comfort and workmanship."

For this reason, says Hemphill, "Teens are less of a factor today (as a buying influence) than in the past, because of rising car prices. The average new car price today is $11,000. Teenagers cannot afford that kind of cash outlay, nor can they get credit.

"Once we have more product in the lower priced segment, and we will, teenagers will become relatively more important than they have been in the past. A tremendous teenage market exists for new cars priced in the $3000-5000 segment—the mini car market," says Hemphill.

"Teenagers will be able to buy cars in the mini-car segment. It's analogous to the VW Beetle days. The early success of the Beetle was attributable to parents buying them as a substitute for used cars because of their low price," continues Hemphill. ■—Jennifer G. Mintzer

Car Buyer Survey

The Micro Car!

"Would you buy one?"

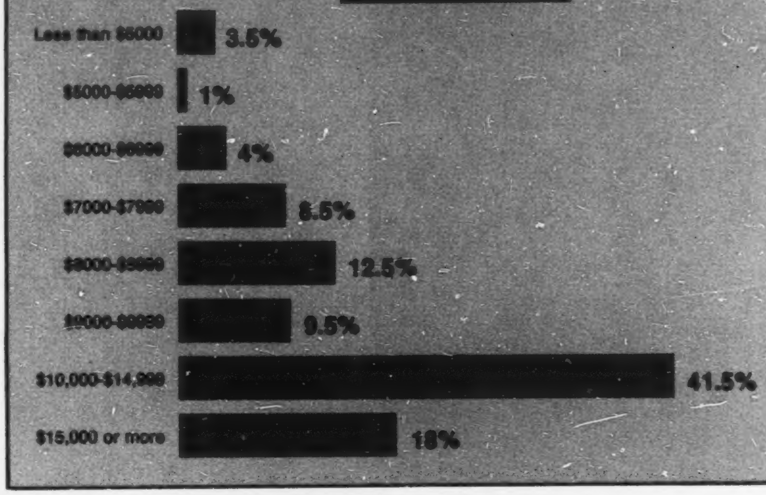
It seats 4, gets 50 mpg, has a 1.0-L, 3-cylinder engine and costs $5000.

YES! 51.5%

NO! 41%

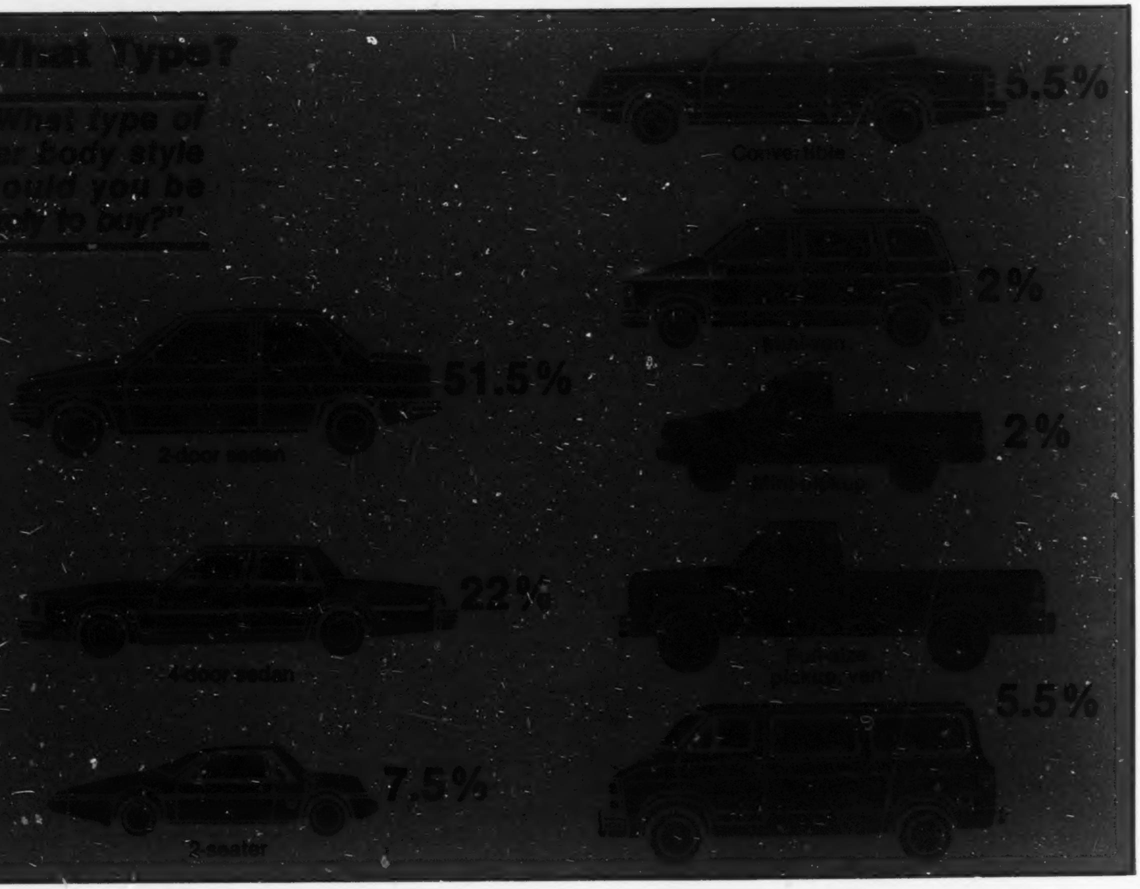
How Much?

"How much would you expect to pay for your next new car?"



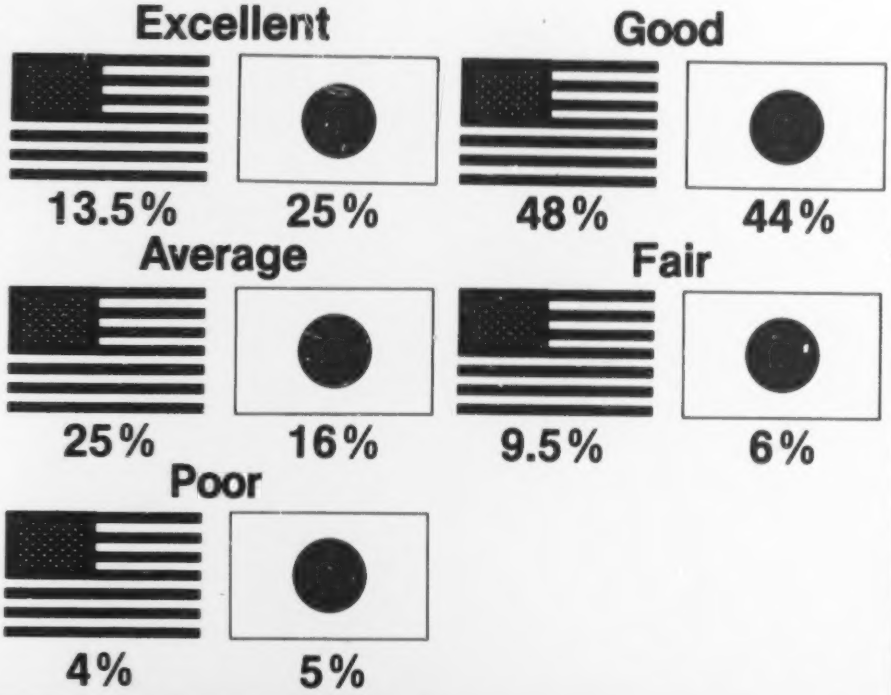
What Type?

"What type of car body style would you be likely to buy?"



Who Has The Best Quality?

"What are your perceptions of the overall quality of US and Japanese-made cars? Would you say that the quality is . . .?"

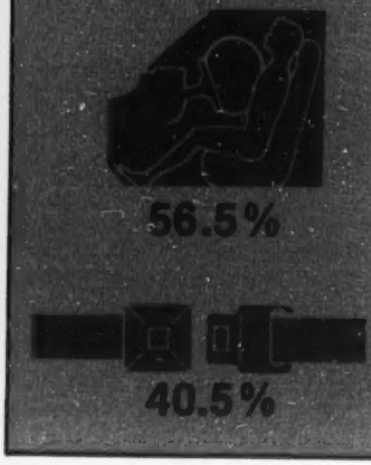


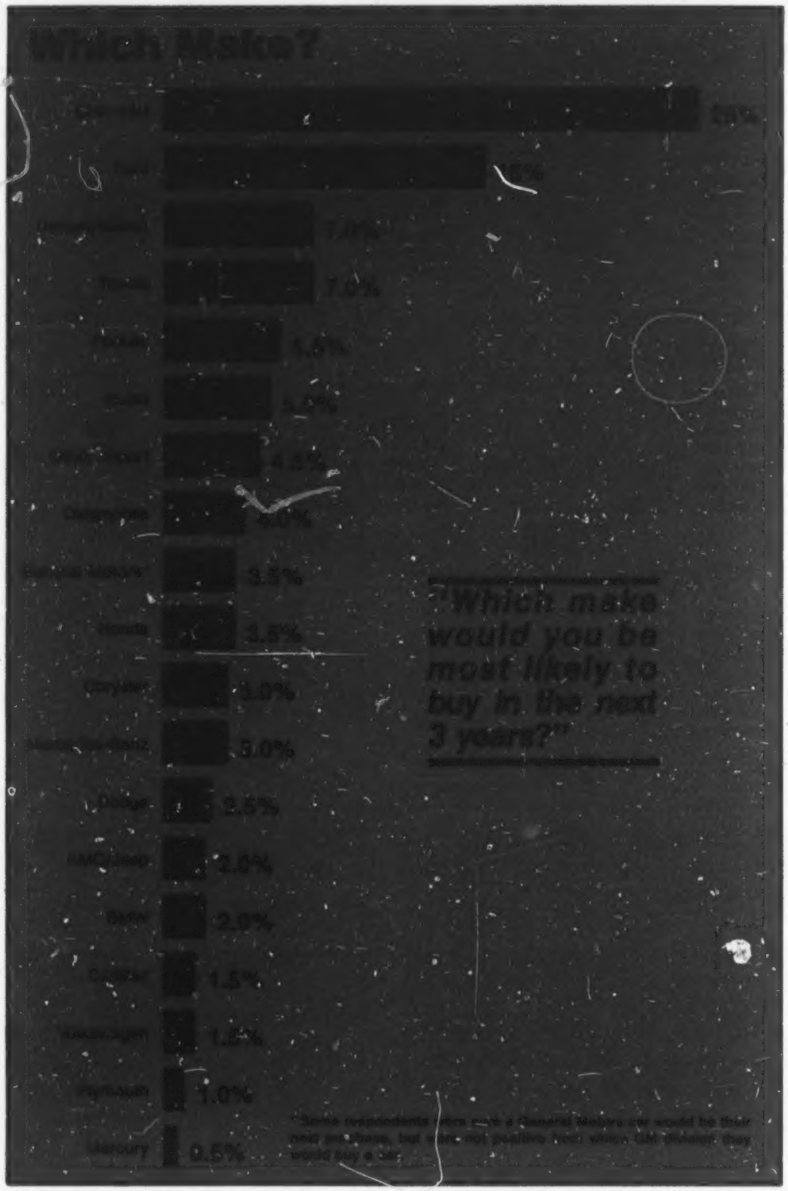
Do You Buckle Up?

"How often do you wear a seatbelt when you drive?"

Passive Restraints vs. Seatbelt Laws

"In a new car, would you rather have . . .?"





*Some respondents were sure a General Motors car would be their next purchase, but were not positive from which GM division they would buy a car.

is also in the top five," Peterson said.

Are Airbags Wanted?

And what about safety? According to our survey, airbags and anti-lock brakes—which continue to share much national debate and media attention—are important to about two thirds of our respondents. If given a choice between passive restraints and mandatory seatbelt laws, our group would rather *not* be made to buckle-up: 60% opt for factory-installed passive restraints like airbags or automatic seatbelts. Only a little more than half of our respondents now wear their seatbelts all the time or sometimes. More men than women—but only 2%—always buckle up.

"Safety is not a purchase motivator," says Power's Peterson. "Everyone tells you that safety is important to them, but when they actually buy the car, it's not what they look for."

So what are these future car buyers *really* looking for? "From a perception standpoint," says Peterson, "we are seeing a real change in the under-30 age group. They will look for a car that has good space efficiency, that is not particularly ugly to look at, is fun to drive, and relatively fuel efficient. This is dropping to fourth, fifth or sixth place now, until we have the next fuel crisis.

"This group wants a low priced car that's fun to drive with adequate fuel economy, that handles well and is inexpensive to maintain." ■

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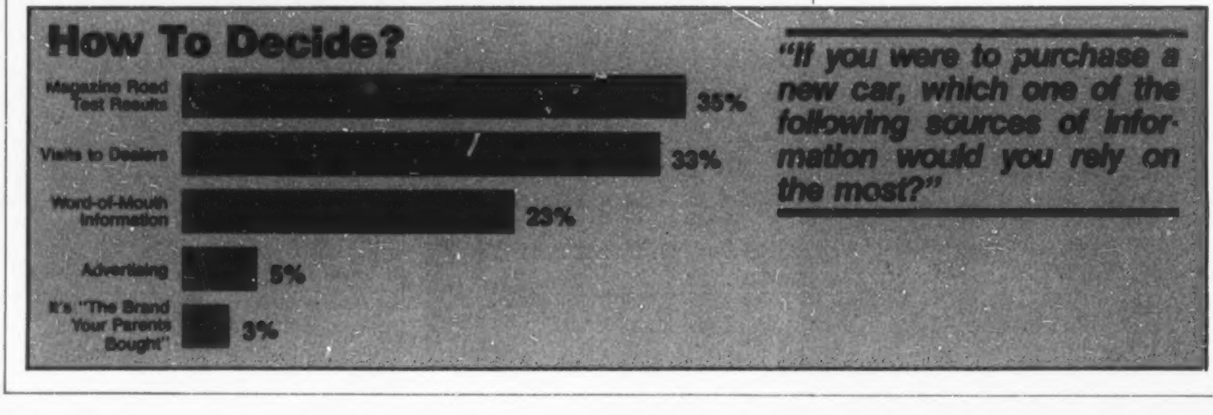


No. 4 INSIDE JAPAN

Japanese Machining Centers

QUALITY GOES IN BEFORE THE PART COMES OUT

Japanese automakers, working two shifts and using ancient US machine tools, achieve 90% machine uptime and incredible efficiencies. How do they do it? Try vigilant maintenance, single digit setup times and maniacal quality control.

by John McElroy

It is a dark, cramped old building. "This is an example of the great Japanese auto industry?" I asked myself incredulously as I walked into Toyota's 20 year old Kamigo #9 engine plant.

But appearances can be deceiving.

Toyota's #9 engine plant makes over 250,000 four-cylinder engines a year, yet it employs only 180 men working on two shifts. And there is not one robot in the plant. It is probably the most efficient engine plant in the world.

Old American equipment, including Cross transfer lines and machine tools made by Cincinnati Milacron and Ex-Cell-O are jammed into the plant.

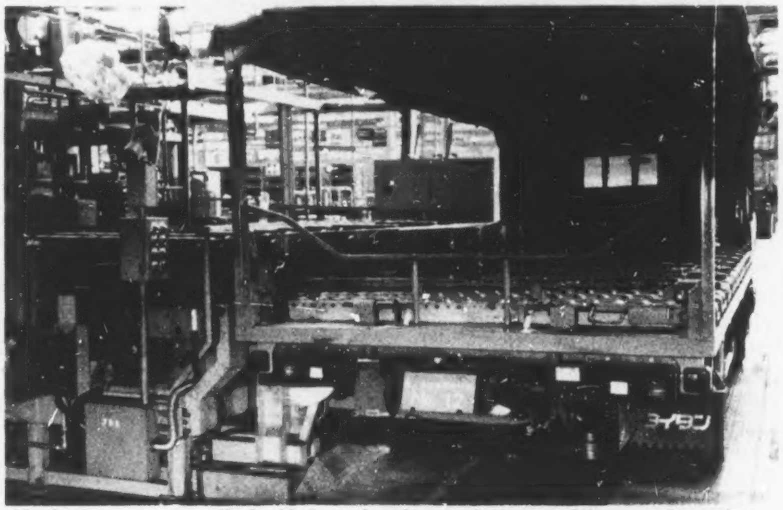
"Why are you using American equipment here?" I asked my guide.

"Because when this plant was built it was the best machinery available in the world," he answered.

I scratched my head. How could Toyota take 20-year-old American machinery and achieve higher levels of productivity than the newest US engine plants using the latest computerized machine tools, test equipment and robots?

Low-Tech Road To Productivity

Well, for one thing, Toyota uses a lot of simple automation. Engine blocks and heads are moved from one transfer line to another by conveyors, and they are moved onto and off the conveyors by simple pick-and-place or lift-and-carry automation (not robots). Crankshafts, connecting rods and caps, and other engine parts are also moved about this way, and they are automatically loaded and unloaded into machines by simple pick-and-place equipment.



Block castings are rolled off the side of a truck at Mazda's Hiroshima 'Magnum' engine plant. Only 0.5% of engines coming out of final test need repairs.

But automation is not the secret of Toyota's success. Instead, an almost fanatical devotion to maintenance and quality make the difference. The philosophy in Japanese machining operations is to promote intensive machine tool maintenance programs that achieve over 90% uptime. And at Mazda's Hiroshima engine plant, for example, an equal emphasis on quality ensures that only 0.5% of engines coming out of final test need repairs.

Two-Shift Production

All machining operations in Japan run on two shifts. Typically, US machining operations run on three shifts to achieve what is called high asset utilization. But, around-the-clock operations don't leave enough time for maintenance, so machines break down when they're scheduled to be running. As a result, most US machining operations operate with only 60% uptime, if that. But three shift operations are beginning to go by the wayside even in the US.

At the Kamigo engine plant, for example, the first shift works from 8 am to 5 pm and the second shift works from 9 pm to 6 am. The maintenance crew works on three shifts and does all repair and tool setup between shifts and during the hour-long lunch breaks. As a result, Toyota has very low levels of downtime. And it is able to eliminate in-process inventory that would otherwise be kept on hand to keep the lines running in case a machine breaks down unexpectedly. But even if a machine does break down

(Continued)

unexpectedly, Toyota is ready.

Jidoka

In 1897, Sakichi Toyoda, the founder of the Toyota organization, developed an automatic loom for weaving textiles. The most intriguing part of the loom was that it was designed to stop automatically if the thread broke or ran out. Out of this came Toyota's philosophy of 'Jidoka,' which means 'to make the equipment or operation stop whenever an abnormal or defective condition arises.'

As you might expect, Toyota has retrofitted all of its old American machine tools at Kamigo with simple limit switches and electric eyes. If a machine makes a bad part, if a part doesn't come out of a machine, or if the machine breaks, it automatically shuts off and a giant overhead board that can be seen throughout the plant lights up, identifying what the problem is. The idea is to never let a machine make a defective part, or if it does, to make sure that the defective part doesn't get to the next station. This way, any quality problem is caught at the source.

To Toyota's way of thinking, if a machine is not making perfect parts, it's not working. And since the machines essentially run themselves, one employee can operate several machines at a time, which has made it possible to reduce the workforce and thus the cost of production.

Additional Observations

Reducing tool change time is an important facet of Japanese machining operations. In most cases, they are able to make tool changes in their engine plants in 8 to 10 minutes, including setup time, meaning production only stops for 1 to 2 minutes. Typically, they will change tools about two times a shift. Quick tool change is needed because most Japanese engine plants don't batch produce engines. By producing a variety of engines based on the automobile assembly plant's production schedule, they can supply the assembly plant on an hourly basis.

Generally speaking, the Japanese automakers use automation to do dull, repetitive work. Human beings are used to provide manufacturing flexibility. The final assembly lines are power and free conveyors that allow the line to operate at the worker's pace. And all inventory for final assembly is placed within arm's length of the line workers so they don't even have to take one step to get the next part they need.

After final assembly the engines go through an automatic 20-minute hot test. At Toyota and Mazda, for example, 99.5% are OK'd the first time through. And most repairs are just a few more final adjustments, not teardowns.

Toyota's Kamigo #9 engine plant, employing only 180 men on two shifts, makes over 250,000 four-cylinder engines a year.

COMPARING CAPABILITIES

	Toyota Kamigo #9 Engine Plant	Chrysler Trenton	Ford Dearborn
Products:	2.4-L 4-cyl. 2.0-L 4-cyl.	2.2-L 4-cyl. incl. turbo	1.6-L 4-cyl. HO; turbo; EFI
Plant Size:	310,000 ft^2	2.2 million ft^2	2.2 million ft^2
Hourly Employment:	180	2,250	1,360
Line Rate:	1,500/day	3,200/day	1,960/day
Manhours per Engine:	.96 hrs/engine	5.6 hrs/engine	5.55 hrs/engine
Shifts:	2	2	1 assembly 2 machining
Inventory:	4-5 hrs avg.	2.5-5 days avg.	9.3 days avg.
Absenteeism:	5% (scheduled)	3% (AWOL)	N.A.
Relief:	Mass	Mass	Mass
Wages:	$11.35/hour (excluding fringes)	N.A.*	N.A.*
Robots:	None	5	N.A.

Chart by: Automotive Industries

**** = industry average is $12.50/hr excluding fringes***

Conclusion

By carefully planning out the layout of their engine plants, the Japanese are able to build very small factories, thus cutting construction costs. Low inventory levels help reduce the need for more floorspace. And they obtain this low inventory level with strict adherence to maintenance and quality programs. As noted, two-shift production and Jidoka increase uptime and eliminate defects.

Quick tool change permits the engine plants to produce a variety of engines and this flexibility allows them to supply their auto assembly plants on a just-in-time basis. All told, this allows the Japanese engine plants to operate at very high levels of efficiency, even with old American machinery.

This could be a valuable lesson for US automakers who think that their only means of becoming internationally competitive is to buy the latest technology. ■

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12/1984

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NUMBER ONE IN THE INDUSTRY SINCE 1895

GM's Smith
Ford's Caldwell
Chrysler's Greenwald
AMC's Tippett

'85 Analyst Survey
Who Says How Many

First Peek:
The New Fiat/
Peugeot Engine

MIT Study:
Auto Scenario
Shifts Gears

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NEXT MONTH

In January, *AI* surveys the world's production engineers, managers, and technicians, asking the question: who builds cars best?

QUOTABLE

"We want to find our own way to become the BMW of Japan, because when I worked for Max Hoffmann, he always told me 'One of these days, the emblem will tell the story.' "—Erwin Sedlmayer, manager of product planning, Subaru of America, talking about status-symbol possibilities for Subaru's six-star emblem by 1990.

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ANALYSTS FORESEE LUXURY CAR UPSWING

As the US enters its third year of economic recovery, major automotive analysts forecast a slight increase in passenger car and light truck sales, with a trend toward luxury cars. Japanese import restraints will probably be lifted but continued in spirit.

by Jennifer G. Mintzer

The picture looks rosey for passenger car and light trucks sales in '85, although some 25% of the market is forecast to go to imports. Since our last survey of auto analysts in the June '84 issue of *AI* (see "Analysts See Continued Upswing & Probable Strike," p. 84), the economy has continued to improve and so have the figures.

For calendar year '85 the prognosis is for further recovery. No great leaps in the figures, mind you, but the analysts say the strong economy has granted the general populace a feeling of well-being plus more disposable income which they are expected to spend on bigger and more luxurious cars.

'85: Year For Luxury

Most of the economists agree: 1985 will be the year for the luxury car. Says Jean Claude Gruet of Dean Witter Reynolds, "...when the economy is strong and people have more disposable income, they tend to up the [model] mix. The overall consumer tends to buy larger cars."

Manufacturers Hanover's senior vp Irwin Kellner says, "The trend seems to be going that way [luxury cars]. And for the overall economy 1985 should be another year of expansion, so that will further enhance the likelihood that luxury car sales will improve."

John Maher, auto analyst at Citicorp agrees, "If you're thinking in terms of large cars, which is typically how the segmentation is done, I see them [luxury cars] improving. Of course, as we've seen over time, as the economy improves and people's own perceptions of their well being improves, they tend to load up on the luxury items, the amenities that make driving a bit more comfortable."

Plus, the younger generation is making its move into this segment of the market. Explains Thomas Kevin Swift, chief economist at Predicasts, "We have a lot of discussion now of

	Citicorp Information Services	Manufacturers Hanover Trust Co.	Arthur D. Little	Dean Witter Reynolds	JD Power & Assoc.	Chase Econometrics	Merrill Lynch	Prescott Ball & Turbin	Predicasts
PASSENGER CARS									
1985 US Production	8.0	8.5	8.0	8.0	—	8.6	7.6	8.0	7.85
1985 Sales, US & Imports	10.8	10.0	11.0	—	10.9	10.4	10.4	10.95	10.5
LIGHT TRUCKS									
1985 US Production	3.6	—	3.4	3.25	—	3.5	2.9	3.4	2.65
1985 Sales, US & Imports	4.1	—	4.0	—	4.35	3.6	4.1	4.1	3.35
Will the Japanese Voluntary Import Restraint Agreement be Continued in Some Form Next Year?	No	Yes	Yes	—	Yes	Yes	Yes	Yes	Yes

the so-called Yuppy, the white collar professional in the post WW-II baby boom generation. They're starting to trade their cars up to a higher quality with more classic style, taste and design. They're starting to fall over into the luxury car area. One of the things is that they're typically purchasing foreign automobiles like Volvo, Saab, BMW, Mercedes, some of the higher priced Datsuns and Toyotas, and Peugeot."

That's why Predicasts forecasts import penetration to run around 25%. Although Predicasts has revised its June '84 forecasts for passenger car sales down slightly, Swift says, "What my current forecast calls for is imports staying at roughly the same levels, but the decline would come largely out of the domestic shipments. The West is now the marginal producer."

Restraints Go Self-Imposed

JD Power & Associates' industry analyst Chris Cedergren puts import share of the market higher at 27-30%. "This is considering that import restraints are lifted or increased substantially. We're going on the assumption that they'll be raised from 1.85 million units to anywhere from 2.3 to 2.69 million units per year, or lifted completely."

Tom O'Grady of Chase Econometrics asserts the import restraints will be only slightly eased, "Import restraints will either be continued with a slight increase in the number of cars allowed to be imported or they'll be self-imposed by the Japanese themselves. They'll moderate it in some way. There will not be a true open market."

Art Davis, auto analyst at Prescott, Ball & Turben, sees a purely voluntary agreement, "...in which there would be some unwritten restriction which would hold shipments down. This year is 1.92 million units. We'd expect no more than 300,000 more next year—in the 2.1 to 2.2 million unit range—without import controls."

Seconding this opinion is Phillip Fricke of Goldman Sachs Research, "There are two ways the restraints could be continued. They could be eased or eliminated. The odds are more in favor of elimination, but elimination of the quota per se. It could only come if the Japanese will agree not to take advantage. So the agreement would continue, but in a more subtle way."

Arthur D. Little's Nancy Gardella says, "I think import restraints will be continued in spirit by the Japanese because they realize it would not be to their advantage to flood the market with Japanese models at this point. Although politically the actual voluntary restraint agreement may be taken off, I think that we'll see some form of voluntary restraints carried out just in spirit."

Mini Market For Mini-Car?

Since most of the economists feel gas prices will remain at current levels, how large a market do they foresee for the mini-car—a vehicle less that 150 in. (*381 cm*) in length and costing about $3500-5000?

"I think that's going to appeal to a very specific market class, to those just looking for a short run commuter vehicle that gets good mileage," says Citicorp's Maher. "But with gasoline prices as low as they are and not likely to rise very much in the near term, I'm not quite sure whether that's going to be a big growth market."

Agreeing is Hanover's Kellner, "There's always a theoretical market for the mini-car, but we think that a year such as '85, the third year of an economic recovery, where the general populace has a feeling of well-being, would not be conducive to too many sales in the mini-car area."

Predicasts' Swift calls the issue, "...similar to the old notion that what we need is a good 5¢ cigar. I have to say the way the economy is right now, with disposable income levels where they're at and employment at a record high, that the market is no good. I think there may be some niches in the market—college students, lower income households, etc. But I don't think it would be that large of a market."

The lower income segment is precisely where JD Power's Cedergren sees the mini-car filling a need. "We are also forecasting the mini-car market to be an exploding market in the late '80s," says Cedergren. "If the mini-cars are brought in and sold for anywhere between $3500 and $5000, that would enable people who previously could only buy a used car to gain entrance into the new car market."

Mini-Vans Boon For Truck Market

Although Chase Econometrics' O'Grady forecasts light truck sales to go down slightly in '85, he says, "The increase in mini-van sales will help light truck sales."

Davis of Prescott asserts, "They [mini-vans] will add to the growth of the whole market."

In fact, according to JD Power's Cedergren, "It [the mini-van] will shoot the truck market to new record heights. The figure I gave you for light trucks of 4.35 million sales—that's a record year—and it's felt most of the increase is mini-vans. Mini-vans in '85 will account for about 15% of the truck market. Considering it's a newly emerging market, it's pretty substantial." ■

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Goldman Sachs	Automotive Information Council	Average
8.35 11.0	8.2 10.8	8.11 10.67
— —	2.5 3.4	3.15 3.87
Yes	Yes	Yes

Target Marketing And Niche Players

by Thomas F. O'Grady

Today, the auto industry is target-marketing and even designing cars for particular groups of customers, or niches. And these cars are not only of better quality, but there's also a much broader selection of them, allowing for a growing diversity in consumer tastes. Is this the result of increased and improved planning or the competitive environment?

The planning process has undergone substantial refinement over the last few years, and today, "target-marketing" is the buzzword. A few years back, whether used in designing and planning new products or marketing existing ones, information about consumers was summarized into average or percent share.

Companies or divisions aimed at the largest group of new car buyers and tracked the median or mean age, percent married, percent male, etc. Since then, there has been an evolution into special techniques, which has developed into two specialized areas: demographics and psychographics (See Sept. '84, "Detroit Goes Psycho!" p. 44). Each of these is touted for its ability to "target-market" products.

Target Marketing

Demographic analysis broadens the view of the market, and auto companies aim for the singles, the upper income earners, the baby boom group, and others. The distribution of buyers can also be examined.

Psychographics became attractive to the automakers as it became increasingly apparent that the auto market was very segmented. As competition in the auto industry picked up, market research firms were able to convince automakers of the importance of consumer attitudes and behavior.

Indeed, both demographics and psychographics have been around for a long time. In that case, why are they only recent innovations in Detroit? The importance of demographics was realized after the Japanese automakers successfully penetrated the domestic market. In retrospect, the American automakers realized that, while they were ignoring the younger, low end of the market, the Japanese were building a strong base in the US.

Thomas F. O'Grady is the director of the Chase Econometrics Automotive Service. He provides market research and market projections to leading companies worldwide.

Now, further niches are being carved out as the automakers are dividing buyers into groups such as yuppies or looking into psychographic profiles. However, all this appears to be reactive to the penetration of so many automakers into the US market.

These techniques have been around for a long time and are only now being used to better understand the consumer groups.

US MARKET SHARES
1984 MODEL YEAR

Company	Market Share	Sales (000)
AMC SHARE	1.96%	$ 201,275
JAGUAR SHARE	0.17%	$ 17,242
BMW SHARE	0.66%	$ 67,860
CHRYSLER SHARE	9.97%	$1,021,798
FORD SHARE	18.61%	$1,906,806
GM SHARE	45.56%	$4,667,130
HONDA U.S. SHARE	1.14%	$ 117,180
HONDA SHARE	3.57%	$ 365,969
ISUZU SHARE	0.18%	$ 17,973
MERCEDES SHARE	0.73%	$ 74,798
MITSUBISHI SHARE	0.37%	$ 38,246
MAZDA SHARE	1.64%	$ 168,475
NISSAN SHARE	4.66%	$ 477,729
SAAB SHARE	0.31%	$ 31,604
SUBARU SHARE	1.53%	$ 156,765
TOYOTA SHARE	5.10%	$ 522,837
VW U.S. SHARE	0.81%	$ 83,084
VW (POR, AUD) SHARE	1.67%	$ 170,768
VOLVO SHARE	0.98%	$ 100,006

Niche Players Lead Big Guns

As the accompanying chart indicates, the ability to be a niche player in the automotive market allows for a large number of companies and products.

Today there are indeed more companies fitting the needs of special groups of consumers. The pattern appears to be that the smaller company tests and develops new markets. Then, if that new market attracts sufficient volume, the larger manufacturers move in and make their presence felt.

The next stage in the development of the planning process will witness the integration of special techniques and data bases. Demographic, psychographic, and more sophisticated market research techniques will be used on integrated data sets. And, as a result, response to specialized consumer needs will be even more apparent.

Already, the manufacturers are responding to the increased information they receive by target-marketing while at the same time, segmenting the market. Although this sounds impressive, in essence, as long as the market is divided into groups, there will be gaps, and those gaps will be left for the niche players to fill.

The benefits to the marketplace today include more product, more custom-tailored products with increased competition, and also lower prices.

The good news is that the industry will continue to make room for all.

The small companies with small shares are not in real danger. They usually also have non-North American markets and they operate efficiently enough to be profitable even at low volumes. They are obviously supplying what many consumers need.

And, with import restraints on the Japanese and capacity constraints on many of the European automakers, the size of the market for most of them is no doubt larger than the chart shows. And, as long as the major manufacturers go after groups of consumers, i.e., target market, they will undoubtedly leave market gaps for the niche players. ■

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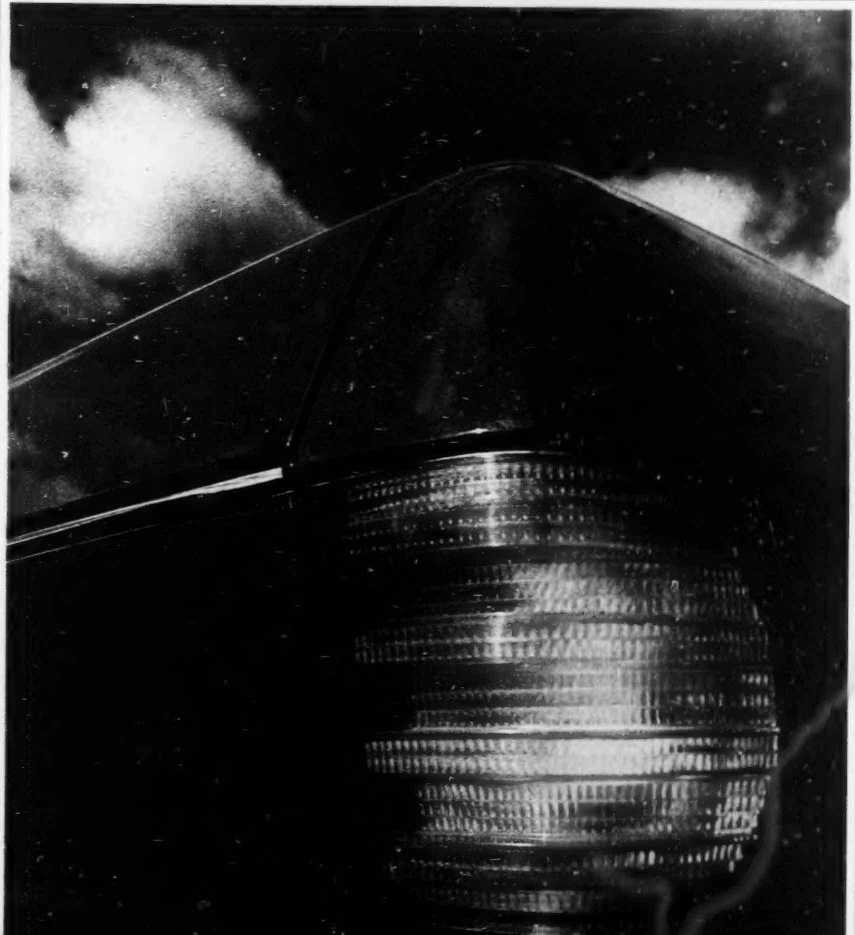

Production Survey:

WHO BUILDS CARS BEST?

What Plant Where?:

Assembly And Stamping Plant Locator

Ford's Aerostar:

More Minivan Madness

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COVER

Who builds the most defect-free car as it comes off the assembly line? Hint: thanks to M-B for the 380 SL used on the cover.

NEXT MONTH

February brings *AI's* 1985 Man of the Year, Philip Caldwell, out-going chairman of Ford Motor Co.

QUOTABLE

"The workers are allowed to drink beer on the line because beer is an essential nutrient of the Bavarian workforce."—Audi tourguide in Ingolstadt paint shop, replying to quip about German workers drinking suds on the job.

"Deere's been one of the few in the business with the balance sheet to go with the business. Now there's somebody else with the balance sheet."—Ron Heiligenstein, chairman of the agricultural consulting firm Brock Associates, speaking about John Deere's newborn IH/Case competition and its big-buck parent, Tenneco.

"Which auto company builds the most defect-free car as it comes off the assembly line?"

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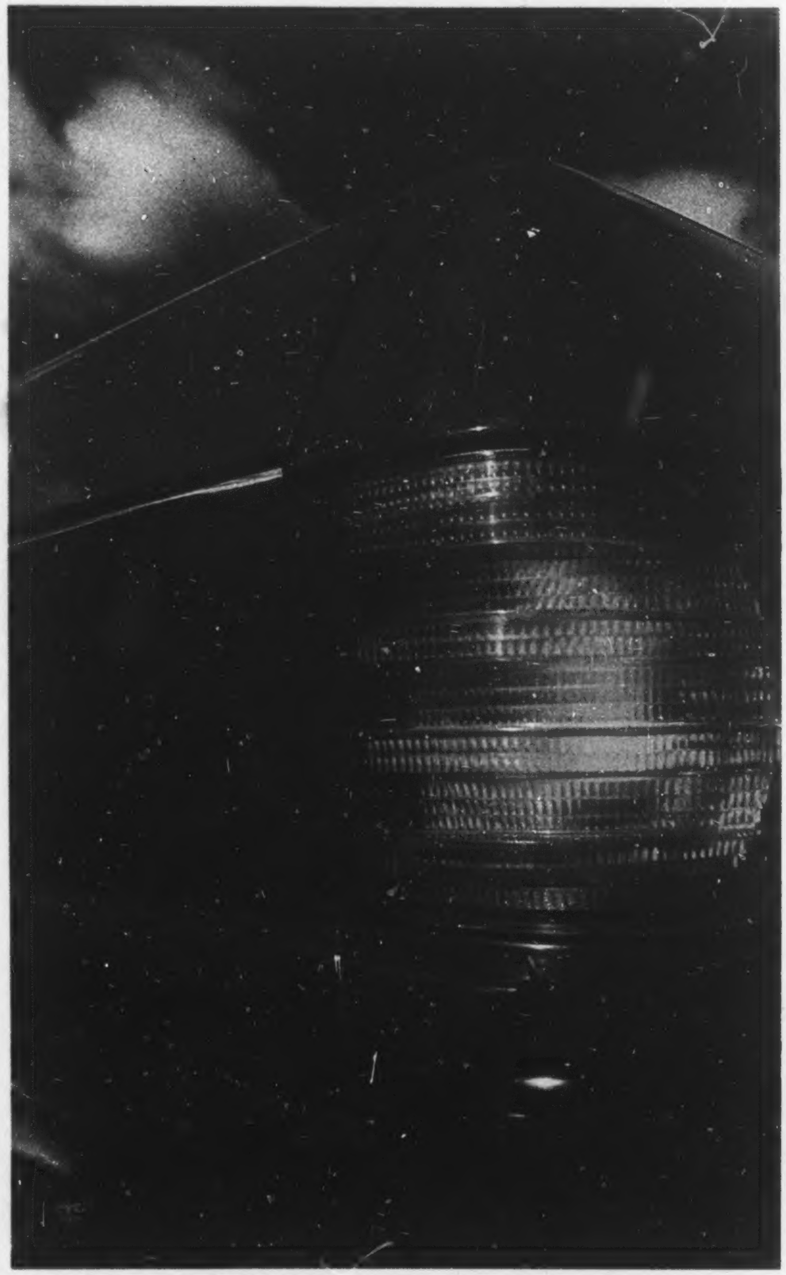
WHO BUILDS CARS BEST?

Going a step beyond your average automobile popularity contest, we ask the men who build the cars who among them builds the best.



Detail shot of a 1985 Mercedes-Benz 380 SL roadster.

by Lance A. Ealey

Who builds the most defect-free car as it comes off the assembly line? According to 1132 world-wide car manufacturing and production managers, engineers and technicians, the overwhelming answer is Mercedes-Benz. With 26.8% of the vote, Mercedes-Benz apparently inspires more than a little respect among those who should know: the men and women who build cars around the world.

Second place went to General Motors, with 18.2% of the vote, Ford grabbed third at 11%, and Toyota came in fourth and Honda fifth at 10.1% and 10% respectively.

Company Men

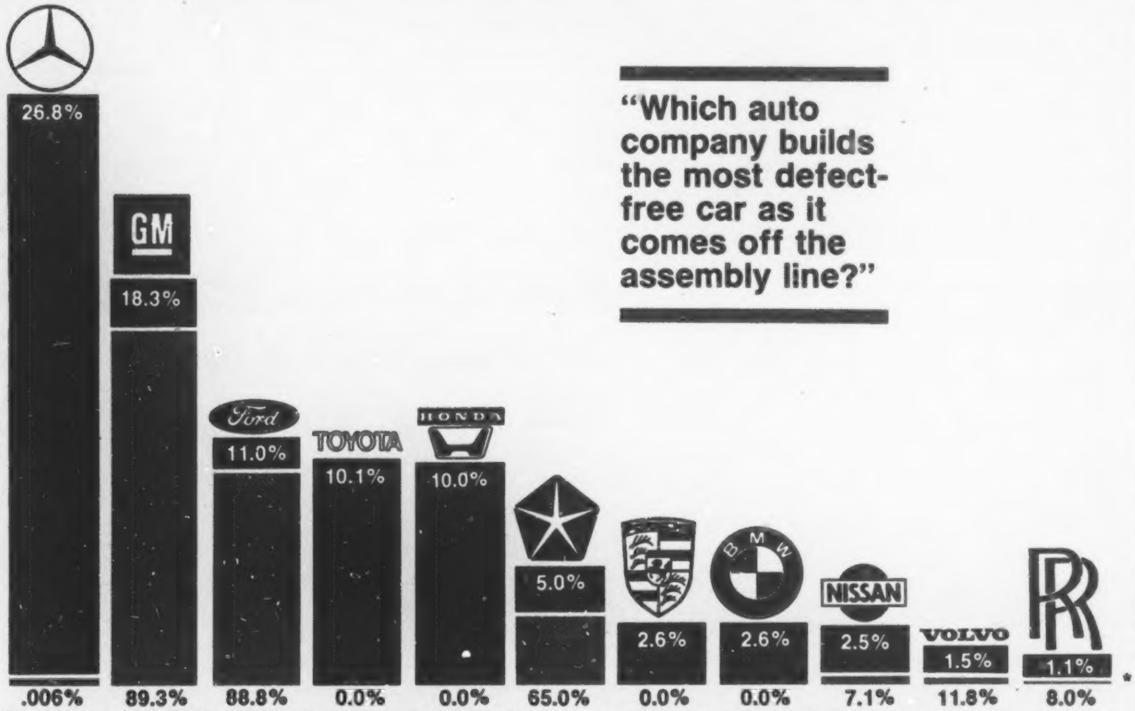
What makes Mercedes' victory all the more meaningful is that, of those who voted for M-B, only a handful work for the marque. Of those who voted for second place GM, over 89% are on the General's payroll, and at third place Ford, almost 89% of those who picked Ford USA work there.

Fourth place Toyota's and fifth place Honda's votes were all of the conquest variety, cast by respondents not associated with either company.

In fact, of all respondents, about 32% voted for the company they work for while the remaining 68% choose other companies. (One respondent who voted for Jaguar penned in beside the question on whether he worked for the company, "No, but I wish I did!")

The survey also shows a rather distinct pecking order of opinion as to who the top five builders of defect-free cars are. After fifth place Honda, the percentage of votes for the remaining companies drops off rather sharply, with Chrysler at 5%, followed by two prestigious German automakers, Porsche and BMW, both at 2.6%.

Our survey was sent out to 6532



"Which auto company builds the most defect-free car as it comes off the assembly line?"

Company men: Red shading indicates how much of a company's total vote was cast by employees of that company.

*** Jaguar 1.1%; Audi, AMC 1%; VW .9%; Ford Europe, Mazda .6%; Isuzu, Opel .4%; Renault, Subaru .35%.**

manufacturing/production managers, supervisors, engineers and foremen world-wide, with the mailing list being generated from *AI's* world-wide circulation.

GM Best At Easy Build

General Motors easily outdistanced every other company as far as being the best at making a car easy to manufacture, with 22.9% of the vote.

In this classification Mercedes dropped to a low 2.1% of the vote: M-B may build near-perfect cars, but the consensus seems to be they don't have an easy time doing it.

Honda and Toyota both scored well in ease of manufacture. In fact, with a combined percentage of almost 50%, GM, Honda and Toyota dominated this category, with the remaining 50% split among 21 other companies.

On the question of fit and finish, Mercedes-Benz again came out on top, with 19.9% of the vote. GM came in second with 15.4%, while Ford was third with 11.5%. Both Honda and Toyota scored high in fit and finish. On the other hand, Nissan scored surprisingly low in both ease of manufacture and fit and finish, with tallies of 5.9% and 4.8% respectively.

Another surprising Japanese low scorer was Mazda, which earned only .6% of the votes on who builds the most defect-free car, and 1.7% and .97% respectively on ease of manufacture and fit and finish.

GM was high scorer in the reliability/durability category, with Mercedes a close second. In this category, Japanese automakers fared rather poorly, with Toyota getting 5%, Honda 2.9%, and the rest of the Japanese automakers scoring in fractional percentages.

Ford gained 13.8% of the reliability/durability vote, and one Ford industrial engineer was inspired to pen beside this question, "Ford, because there are more old Fords on the road than any others."

On the question of whether cars are harder to build today than they were 10 years ago, 58% said they were, while 42% said, no, they were easier to assemble. A GM reliability engineer added the note, "If you are referring to the engineering aspect, then the answer is yes, it's harder, but the actual build is easier."

GM earned nearly three times as many votes as its nearest rival on the question of which auto company best integrates design, engineering and manufacturing. One obviously partisan Buick engineer wrote "It appears that Buick City will be it!"

US Best

The United States won handily on the questions asking which country's engineers are best at problem-solving, design and production engineering. Wrote one 21-year veteran GM process-tooling engineer, who added the qualifier "current new models only" in ranking the US first: "we have taken the lead!"

The two countries following the US in all three categories were Japan and W. Germany, with the Japanese rank-

(Continued)

Car Builders Survey

"Are today's cars easier or more difficult to build than cars built ten years ago…"

More Difficult	58%
Easier	42%

Never Send An Engineer To Do A Mailman's Job

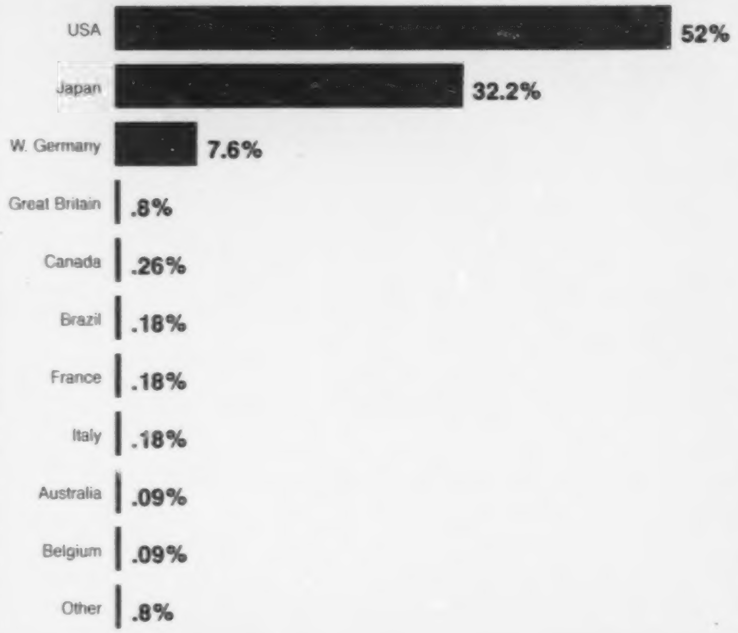
Our survey form statec simply, "Fold, Staple or Tape, and Mail." The condition of some of the questionnaire forms when we received them suggested that several engineers were possibly just a bit paranoid about the responses they had written to our questions.

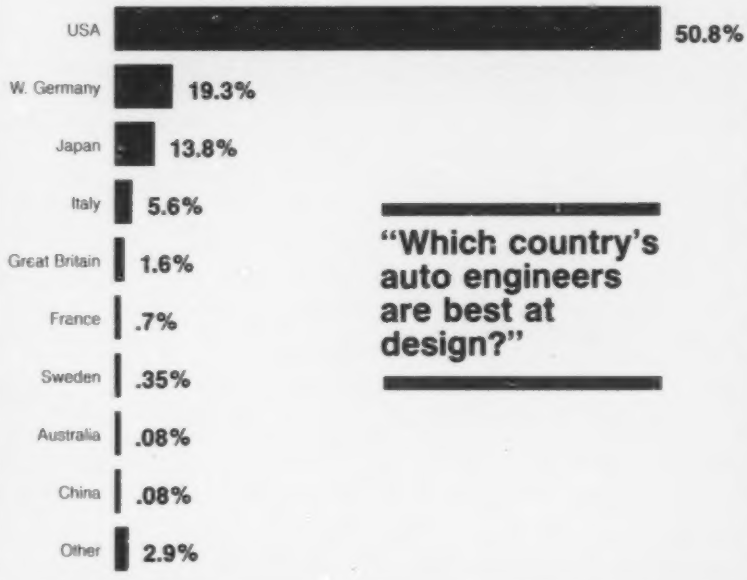
Some forms were sealed so securely that they had to be torn in order to read the answers. Several of them contained three or four staples, while a few had been stapled about ten times all around the edges. Talk about over-engineering!

About five percent of the 1132 forms that were returned were glued closed and some of those had been stapled as well.

One form presented the biggest challenge: it was not only massively stapled but also taped around every edge with black electrical tape. Whoever you are out there, you'll be happy to know that I did get it opened without ripping it and your response is included in our results. Just don't go overboard next time, OK? —*Mary Ann Angeli, alias 'The Tabulator*

"Which country's auto engineers are best at problem-solving?"





"Which country's auto engineers are best at design?"

"...and will they become more difficult to build in the future?"

No!	**52%**
Yes!	**46%**

ing second in production engineering and problem-solving where Germany took second place in design.

In fact, the combined totals of the US, Japan and Germany in all three categories hovered in the 80-90 percent range, with the closest challenger being Italy, which received 5.6% of the vote in design. As one engineer broke design: "other than styling—Germany; styling—Italy."

Perhaps the most interesting part of the survey was that asking respondents to rate twelve systems or techniques as to their importance in improving the quality of cars being built.

Conformance to specification was considered by 37.7% as being of greatest importance, and we can assume that many in choosing this category were voting for the implied conformance to design intent—not just to getting tolerances to occur between the two widest specifications allowable. As one Ford engineer wrote, "consistency within spec is very important."

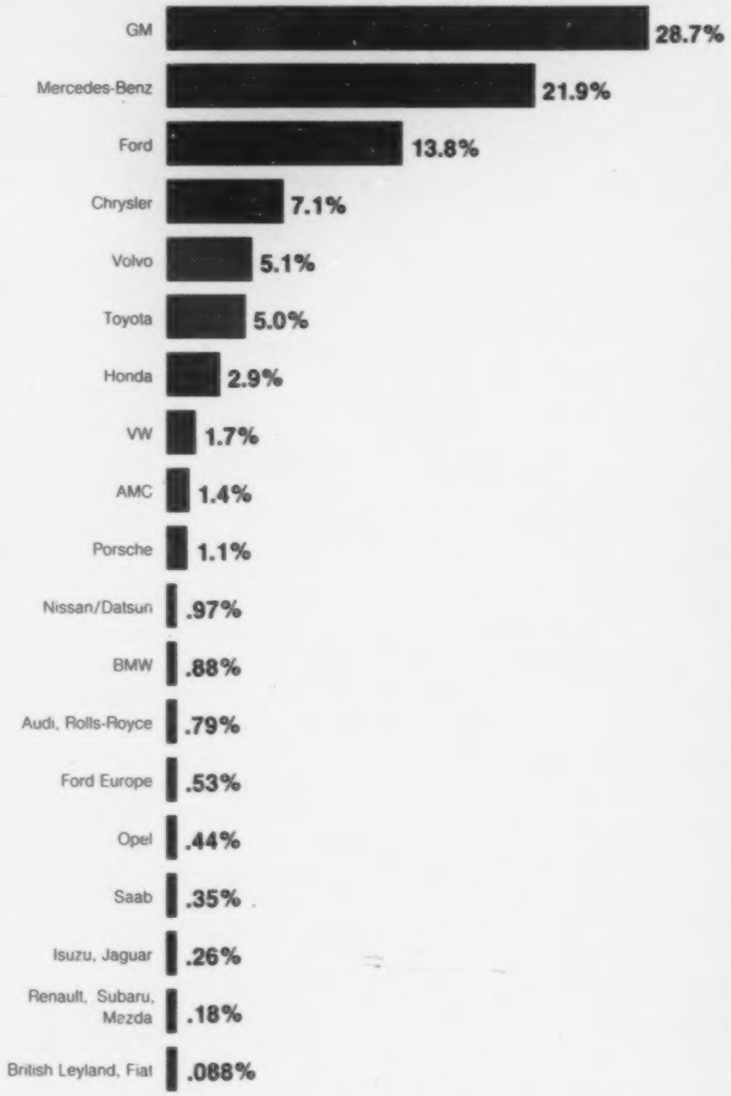
Second in the most important category was employee involvement, showing just how much awareness there is among the people who actually build cars of the need for a totally engaged labor force.

JIT A Snoozer

Just-in-time production achieved a surprisingly lackluster showing, landing on the bottom of the heap in the most important category, while achieving the highest score in the least important category. A few of the comments written beside just-in-time included, 'not necessary', 'doesn't

(Continued)

"Which auto company designs the best vehicles for reliability and durability?"



"If you personally use CAD/CAM in your day-to-day activities, how would you rate it as an effective tool?"

Effective	**55%**
Fairly Effective	**43%**
Not Effective	**1.5%**

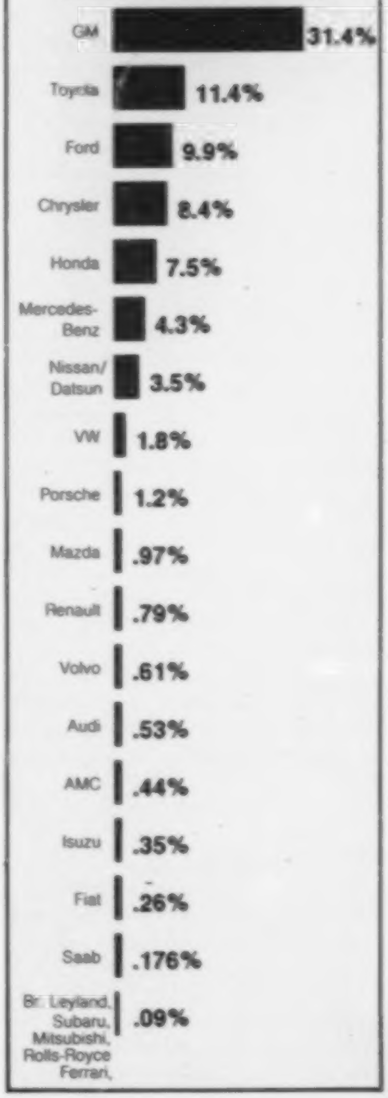
work', and 'not effective'.

Most of the negative response generated by just-in-time production came from US engineers who apparently just don't go along with the build-as-needed-with-total-quality-control philosophy.

One telling comment from a US process engineer shows some of the frustration domestic manufacturers are having with attempts to implement just-in-time: "We cannot scrap [our] back order parts [supply method] and still run."

In looking at the rankings of most important versus least important categories, it becomes evident that the basics are on most manufacturing and production people's minds when it comes to quality: it's got to be in spec, and the best way to keep it in spec is through employee involvement with an emphasis in areas such as statistical quality control, preventative maintenance to keep good part productivity up, in-station inspection and stabilized schedules. Assembly automation was not high on most respondents' lists; neither was mass relief, which is often touted as vitally important to assuring consistent quality builds.

"Which auto company best integrates Design, Engineering and Manufacturing?"



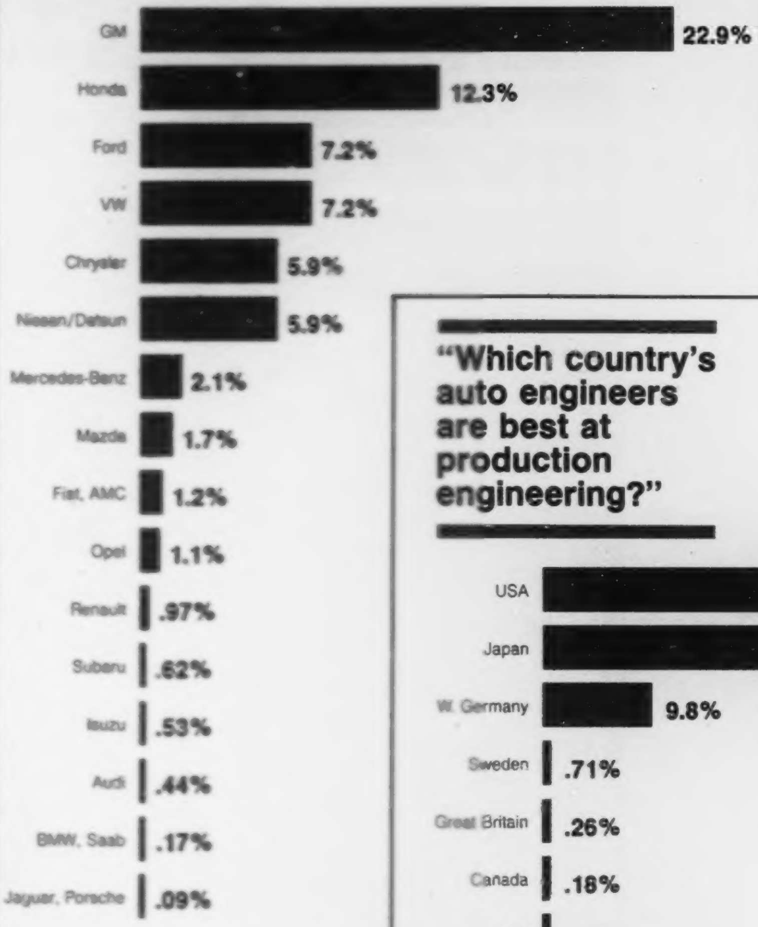
RANKINGS

	LEAST IMPORTANT									MOST IMPORTANT
	1	2	3	4	5	6	7	8	9	10
Conformance to Specifications	2.2	1.8	2.1	2.8	5.4	5.1	8.7	17	13.7	37.7
Employee Input	3.2	3.2	2.8	3.0	7.4	6.8	8.6	15.7	10.2	36
Statistical Process Control	3.2	4.7	3.5	4.9	9.4	6.6	10.9	19.5	11.1	22.4
Preventive Maintenance	3.4	3.9	4.5	5.5	9.3	9.0	9.4	15.8	11.6	19.8
In-Station Inspection	4.0	3.7	5.7	5.3	10.9	9.0	10.6	15.4	11.9	16.5
Stabilized Schedules	2.3	3.4	4.2	5.8	11.7	8.2	12.7	17.9	11.8	14.6
Assembly Line Automation	3.0	3.6	3.6	6.0	14.0	10.6	11.0	19.3	9.7	13.8
Final Inspection	10.3	7.1	8.7	6.7	14.5	6.9	9.5	9.3	5.1	13.0
Manufacturing Resource Planning	2.8	4.2	6.4	6.5	14.4	11.5	12.3	15.9	7.6	11.4
Mass Relief	11.8	7.9	7.1	5.6	12.5	6.7	10.4	9.3	4.6	9.5
Reduced Setup Times	7.9	8.2	8.3	8.2	15.8	9.2	10.9	9.0	4.5	5.4
Just-in-time production	16.8	9.7	7.8	7.4	14.7	7.8	6.8	8.0	3.4	4.7

All figures are percentages

"Rate each of the following on a scale of 1 to 10 (with 1 being the lowest and 10 the highest) as to their *importance in improving quality in the cars you build.*"

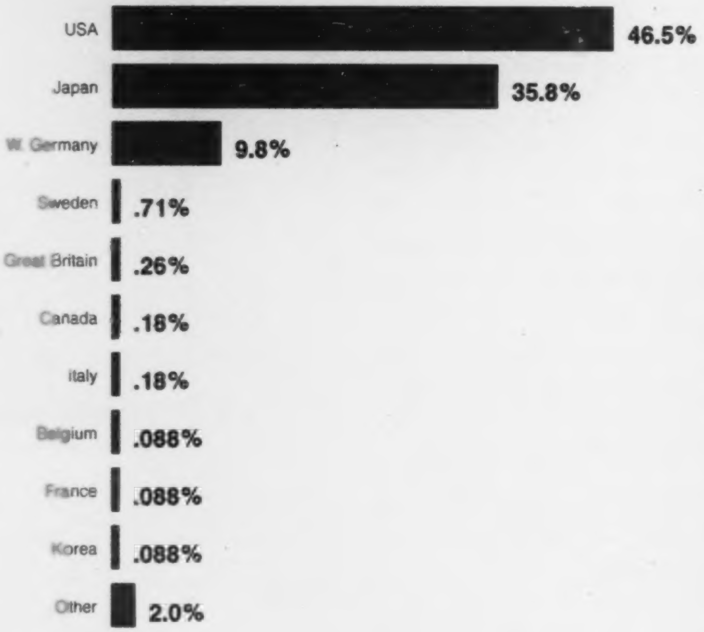
'Which auto company designs the best vehicles for ease of manufacture?"



"Should part of a plant manager's yearly bonus be based on quality levels achieved at the plant?"

Yes!	**85.8%**
No!	**11.2%**

"Which country's auto engineers are best at production engineering?"



Other Factors

For this question under the category 'other factors' came 19 votes for design, 18 for management commitment to quality, nine votes for design with assembly in mind, and five for design quality. One vaguely military-sounding vote was cast for "part deproliferation," another for pride,

(Continued)

one for politics and another for "enough people on the job." Another, apparently frustrated, engineer wrote "get rid of plastic parts that break all the time," while three engineers voted for experimental design, and one senior manufacturing engineer from Ford wrote, "engineers must regain control from accountants."

Around 30% of the respondents personally use CAD/CAM in their day-to-day activities, and of those, 55% considered it an effective tool, 43% said it was fairly effective while under 2% said it was not effective. Several respondents from outside of the US were not familiar with the term CAD/CAM.

On the thorny question of whether a plant manager's yearly bonus should be based on quality levels achieved at the plant, a resounding 85.8% said yes, it should.

Among the qualifiers to this mandate were: "only if quality audit is performed by out-of-plant personnel," and "if and when human judgement can be taken out of the current audit systems."

On the other hand, among the naysayers was a quality control technician who said: "He has the responsibility of the plant but if the workers wanted to they could really hurt him." Among those who disagreed entirely with the plant manager getting a bonus at all came, "Why should he get a bonus when the people that make it happen can't?" And from a general manufacturing superintendent, "I disagree with the bonus system, it's too short term-oriented."

Our last question asked for an honest evaluation of the respondent's own plant: how high do you rate the quality of the cars built in your plant? Almost 16% gave their plant a very high quality level, while the majority, 48% rated their quality high, 17.7% said average and only 2.7% rated their plants low or very low in terms of quality. ■

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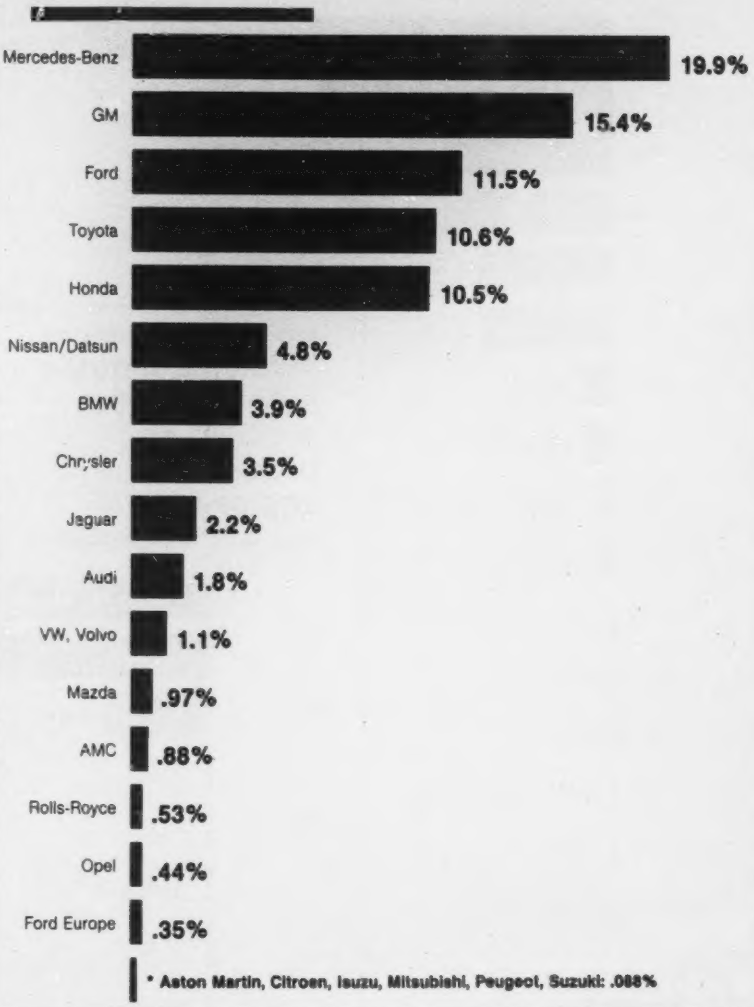
"Which auto company designs the best vehicles for fit and finish?"



* Aston Martin, Citroen, Isuzu, Mitsubishi, Peugeot, Suzuki: .088%

All chart percentages except those concerning CAD/CAM effectiveness are based on a total of 1132 respondents. The CAD/CAM effectiveness chart percentages are based on the number of respondents who indicated that they use CAD/CAM on a day-to-day basis. Many of the charts will not add up to 100% because some respondents did not answer all of the questions.
The US/international split of respondents was 88%/12%.

BIG GROWTH FORECAST FOR ZINC-COATED SHEET

The quest for tougher corrosion-fighting sheet-steel is causing US automakers to look to Japan's steel industry for a capacity-free source of supply. Will Zincrometal use diminish?

by Peter J. Mullins

The New United Motors Mfg Inc. (Nummi) plant in California (where General Motors and Toyota have a joint project to produce compact cars) will use monthly some 2000 tons (*1800 t*) of high tensile and corrosion-resistant steel sheet imported from Japan. Nippon Steel Corp. will supply half and the rest of the order is to be split between Sumitomo Metal Industries, Nippon Kokan Kaisha and Kobe Steel.

Naturally the Japanese steelmakers concerned are delighted at what they recognize is a major change in GM's normal 'buy American' policy. More important, they see it as a foot in the door to enable them to sell more sheet to other divisions of General Motors in the near future.

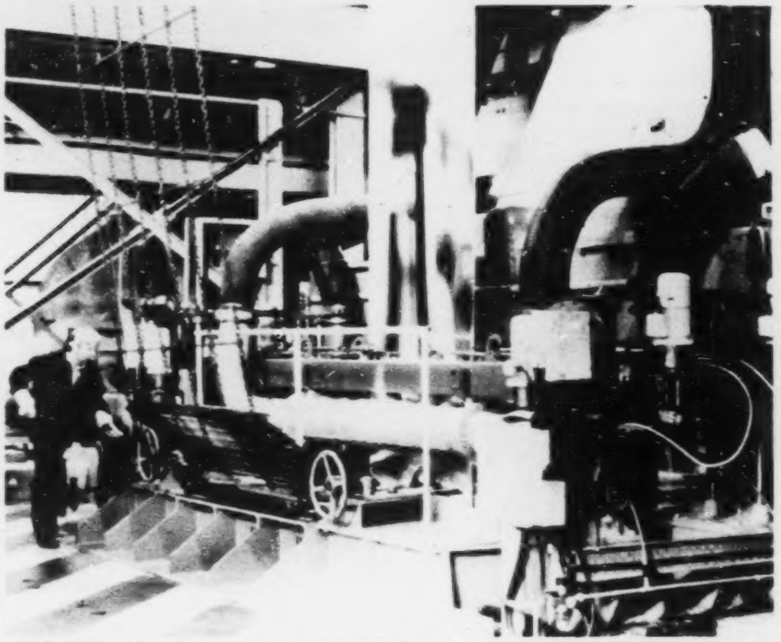
Why the shift in GM's policy?

Question Of Capacity

Basically, it's a question of capacity. The American steel industry has been caught by the auto companies' drive for long-lasting corrosion protection. US capacity for hot-dipped galvanized sheet is around 6½ to 7 million ton/yr and 1984 demand is running at about this figure (*5.9-6.3 million t/yr*).

There are, however, a number of complications. The auto industry is trending towards sheet that is not only coated on the inside—to protect the closed box sections where most of the worst corrosion has been proven to start—but on both sides. This will enable carmakers to meet the much tighter regulations coming in 1986 which demand 5 years cosmetic and 10 years structural protection.

Also, the auto industry wants sheet that is easily formed—similar to the cold-reduced sheet presently used but having zinc coating on one side only.



End of hot-dip galvanizing line at British Steel Corporation's Shotton Works.

Electro-galvanized steel is preferred in this respect because of carmakers' requirements. But the US steel industry is even shorter of electrolytic galvanizing capacity than it is of hot dip.

Electro-Zinc For The Future

Most steel industry experts agree that the electro-zinc process is the versatile way for the future. A number of American steel companies have plans under way to install electrolytic capacity. These include Bethlehem, Inland, US Steel and Wheeling-Pittsburgh, the latter being a joint project with Nisshin Steel of Japan.

Japanese steelmakers have established a big lead in electrolytic capacity and have some five or six electrolytic lines now in operation. Ironically, the whole Japanese lead was built up on the basis of the need in the North American market for corrosion protection for their exported cars.

There was not the same need in the Japanese domestic market and many Japanese cars operating at home use conventional primers and paints only.

According to Austin Matthews, manager of product marketing for BSC's Strip Products Group, up to around 1989 there will be a steady shift from Zincrometal and cold-rolled sheet to zinc-coated, mainly to improve perforation resistance.

The zinc-coated sheet will mostly be single-sided in the first instance and a mixture of electrolytic and hot dip with the former being predominant. (Zincrometal, incidentally, is a zinc-bearing paint hitherto used extensively by US carmakers.)

(Continued)

Evolution Toward Two-Sided Coat

There is likely to be an evolution from one- to two-sided zinc coatings to maintain the perforation resistance and gradually improve the cosmetic protection.

Towards 1986, electro-zinc alloy coatings could be coming in strongly in Europe. These include iron and nickel-zinc alloys and multi-layer coatings with chromium and chrome-oxide on top.

These will offer improved qualities such as corrosion resistance, good paintability and enhanced welding properties because of the use of thin coatings.

During the same period, hot-dip zinc coating will be used because of the improved steel and zinc surface qualities. The choice between hot dip and electrolytic will depend on individual carmakers' progress.

Nevertheless, quality car makers like Porsche have switched to all-zinc-coated bodies and French carmakers are not only quite advanced but already using single-side electro-zinc and hot dip galvanizing for volume car models. In fact, it is a French company Ziegler, (part of the Sacilor group) that is the first in Europe to get into production with Galfan, a new development for which great claims are made.

Galfan Claims Made

Galfan is a zinc alloy coating which contains 5% aluminum and rare earths (700 ppm).

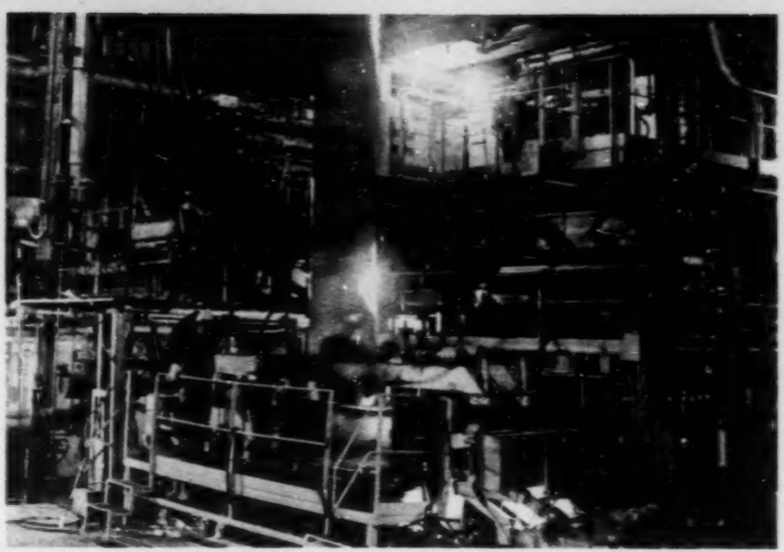
Developed by the Centre de Recherche Metallurgiques in Liege under the direction of the International Lead Research Organization (ILRO), the process has been licensed to several European companies and Inland in the US. So far, Ziegler and Hoesch in Germany, are the only companies to market the product in Europe.

Advantages claimed for Galfan include good adhesion and high corrosion resistance—at least double that of conventional galvanized steel. It is claimed to be higher suited to complex stamped parts because of its good adhesion under severe deformation.

Experts are forecasting a period of sharp growth in the market for electrolytic zinc-coated sheet from 1984 to 1987.

Thereafter, to about 1990, electrolytic and hot dip galvanized sheet should grow steadily, partly at the expense of Zincrometal and partly with market expansion.

Currently, around 470,000 ton/yr of zinc-coated products are used in the European motor industry. By 1990, this figure is likely to be up to 750,000 ton/year (*426,000 vs. 680,000 t/yr*).■



Armco hot-dip galvanizing line producing Zincgrip Ultrasmooth steel in the US. US capacity for hot-dipped galvanized sheet is around 6½ to 7 million tons per year: about the same level 1984 US demand is running..

AUTOMOTIVE GALVANIZED STEEL UTILIZATION PROJECTIONS

(Million Tons)

Year	'83	'84	'85	'86	'87	'88	'89
Domestic Galvanized Steel Shipments							
Hot Dipped	1.27	1.50	1.46	1.22	1.21	1.35	1.35
Electro	.45	.50	.60	.78	1.20	1.40	1.50
Total	1.72	2.10	2.06	2.00	2.41	2.75	2.85
	Pounds of Domestic Coated Steel/Vehicle (Blank Weight)						
Hot Dipped	240	260	265	255	235	240	240
Electro	85	100	110	165	235	250	260
Zincrometal	180	180	170	140	100	80	70
Total: Coated Steel Use	505	540	545	560	570	570	570

(Courtesy: BSC)

Projections showing US domestic use of galvanized steel. Note that whereas the demand for hot-dip galvanized steel plateaus out between 1.2 and 1.4 million ton, the use of electrolytic galvanized steel is expected to triple from about 0.45 to 1.5 million ton by 1989. Total use of zinc-coated steel per car is expected to rise by nearly 13%.

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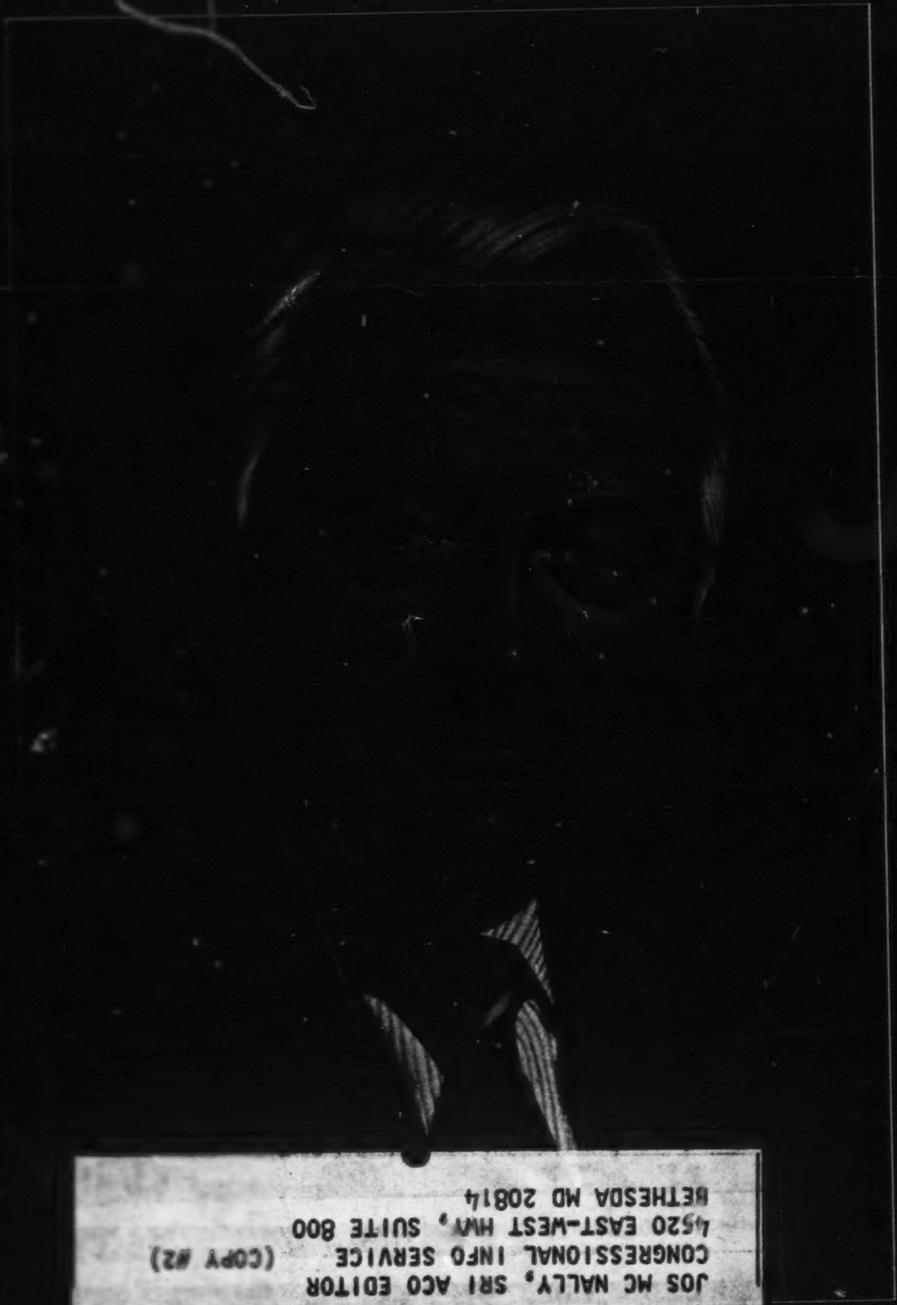

Philip Caldwell

How Canada's Super Supplier Does It

Experimental Design Hits Detroit

JOS MC NALLY, SRI ACO EDITOR
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February, 1985/Volume 165, Number 2

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COVER

We salute Philip Caldwell, *Automotive Industries'* 1985 Man of the Year and Career Achievement Award winner.

NEXT MONTH

March brings the low-down on Ford's Taurus project, plus the Japanese invasion of America.

QUOTABLE

"The market is so lucrative in North America that every maker is going to be here. They just love the American consumer because we buy and buy and American consumers aren't worried about where it came from."—Robert Stempel, GM VP and head of the BOC (Buick-Oldsmobile-Cadillac) Group.

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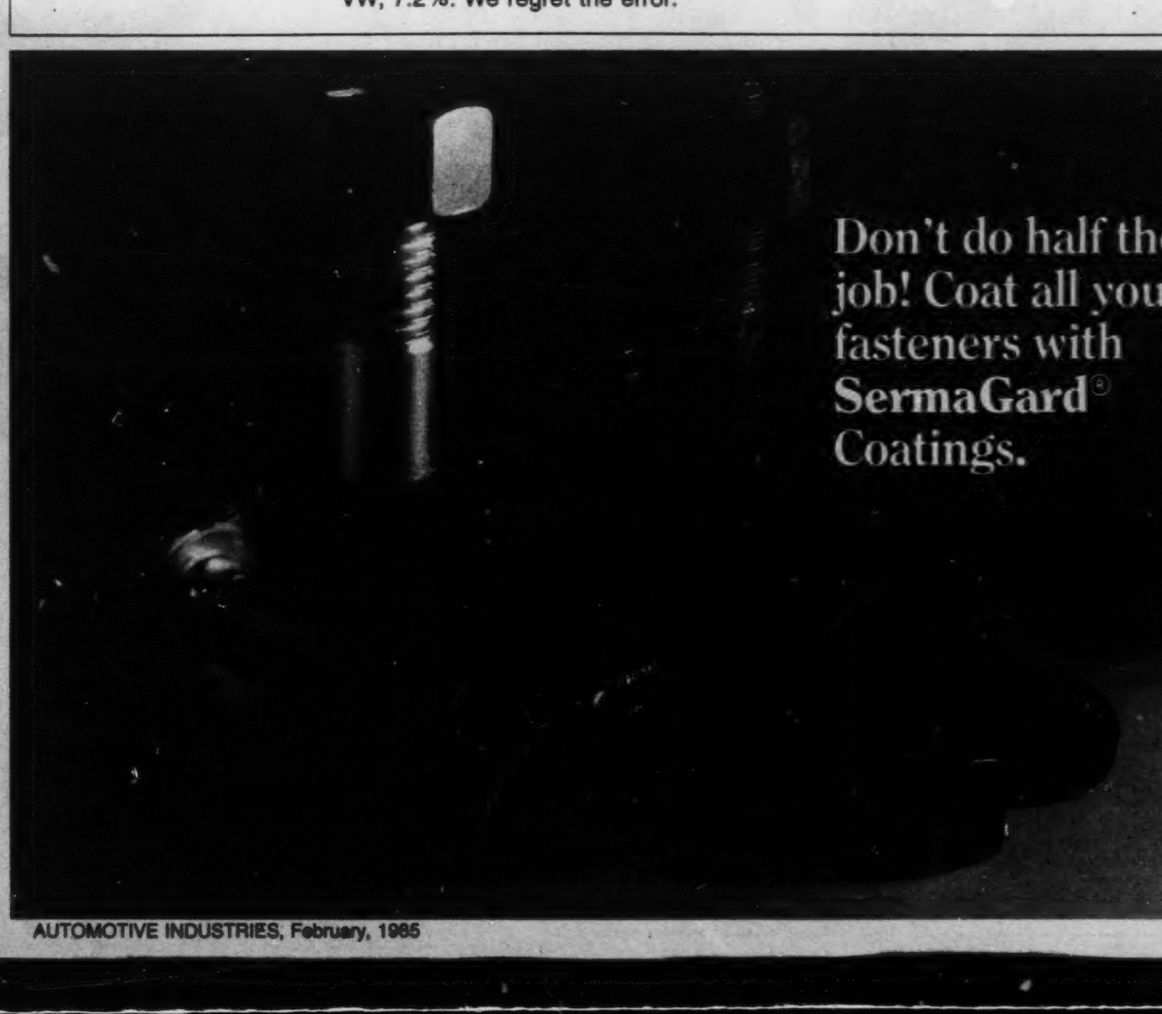
Light Partnership General Motors' Fisher Guide and Lucas Industries Inc. are now partners in an agreement giving Fisher license to use Lucas's patented headlamp reflector material. The dough molding compound, which due to changes in vehicle lighting regulations can now be used in the US, provides higher optical accuracy than conventional reflectors and is lighter in weight. Lucas Electrical will also design and develop a headlight in conjunction with Fisher Guide for one of GM's large volume vehicles.

Tennessee Sentras Next month, less than two years after its first US-built pickup trucks began rolling down their Smyrna, TN assembly line, Nissan's US manufacturing arm will begin production of Sentra econocars. According to Marvin T. Runyon, Nissan Motor Manufacturing Corp. USA president, Nissan is looking to build 100,000 Sentras and 140,000 trucks at Smyrna by 1988. Runyon said that a second shift will be added in June, increasing the facility's 2100-member workforce to 3000. Nissan has shelled out $85 million for Smyrna's Sentra tooling and equipment; pre-production testing and quality checks are going on as you read this. Note that the entry-level Sentra, which lists for $5499 in just its birthday clothes, is the type of car US automakers claim they can't build here. Insiders say a designed-for-America Sentra may be in the works.

Correction All eagle-eyed *AI* readers who noticed an omission in January's 'Who Builds Cars Best' feature survey can pat themselves on the back. In the chart titled 'Which Auto Company Builds The Best Cars For Ease Of Manufacturing?' (p. 37) second place Toyota apparently came under our Art Department's proverbial X-Acto knife. The top five placers in the above category's chart should have been: GM, 22.9%; Toyota, 14.6%; Honda, 12.3%; Ford, 7.2%; VW, 7.2%. We regret the error.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"We've learned an awful lot from that already, we've got things in there that have already been reflected in our current operations, and we need a lot more."

The car itself won't be GM's lowest-priced car, Smith said. That will probably continue to be the imported-from-Japan Chevrolet Sprint.

The Saturn will be small, about 2000-lb (*950-kg*) and feature a new engine and two new transaxles. The car GM showed in January when it announced the new corporation had a 1.9-L four-cylinder engine. *AI* has learned a three-cylinder engine might be slated for Saturn use.

GM vice chairman Howard Kehrl claims the manual transaxle for the Saturn will shift "better than anything we've ever had" and deliver lowest parasitic drag of any transmission GM has ever tested.

Kehrl also asserts that the Saturn's powerplant gets the best brake specific fuel consumption of any engine GM has ever tested, its own or its competition's. He said GM is looking for 45 mpg city and 60 mpg highway from the Saturn. (*5.2/3.9 L/100 km*)

The cars will be sold in two- and four-door versions initially, perhaps as soon as late 1987. ■

UAW Study Sees $2600 Japanese Advantage

by John McElroy

Over the last five years, the UAW has scoffed at studies that show the Japanese automakers have a $1500 landed cost advantage. And with good reason. A good portion of the Japanese advantage cited in those studies lies with lower wages and many fewer employees.

When UAW president Owen Bieber was speaking at the US-Japan Auto Industry Conference at the University of Michigan one year ago, he lambasted these studies.

"I'm referring of course to the famous $1500 landed cost advantage supposedly enjoyed by Japanese small cars," Bieber said. "We in the UAW were skeptical about the figure and the reasons for it—from the start."

So the union went out and sponsored a study of its own.

And sure enough, it found out the landed cost difference wasn't $1500. It was $2600. So the union decided not to make the study public. Nonetheless, *AI* was able to obtain key information.

The UAW study, called the Telesis Study, looks at the Japanese advantage from a number of categories. And one of the main advantages it

(Continued)

Japanese Advantages Per Car

Manufacturing Efficiency	$800
Assembly Efficiency	$400
Wage Differences	$625
Currency Differences	$750
Taxes	$575
Total Cost Advantage	$3150
Less Shipping Cost	-$ 550
Landed Shipping Cost	$2600

Source: UAW Telesis Study

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Owen Bieber laughed at the $1500 Japanese cost-per-car advantage—then the UAW's own study upped that figure to $2600!

says the Japanese enjoy is a $625-per-car cost difference due to lower wages. So the union has quietly stopped knocking the other studies—but it isn't keen to talk about what the Telesis Study turned up.

"We've not yet decided how much we want to make public," says one of the union's international economists. ■

Santana Heralds China's New Auto Beginnings

by Thomas A. Behne

The recent agreement between the Chinese government and Volkswagen to manufacture 30,000 Santana (US Quantum) models a year in Shanghai is a signal China is aggressively seeking the technology needed for it to start a domestic auto industry that can also compete in the world market.

Under the deal, the Shanghai Volkswagen Automotive Co. Ltd. has been set up, with VW holding a 50% share. Other partners include the Shanghai Tractor and Automobile Corp.; Shanghai Trust and Consultancy, a subsidiary of the Bank of China; and the China National Automobile Industry Corp.

The plan has been under negotiation for several years and has recently been expanded slightly from 20,000 cars/year. The original intention was to confine the cars to government offices and taxi use. Now, the extra 10,000 will be made available for sale to private individuals. Full production is due to be reached in 1989.

The engine plant to supply this facility will be built between 1986 and 1989 and have a total annual capacity of 100,000 four-cylinder gasoline and diesel units. The surplus output (over and above the Chinese requirements) will be exported to Volkswagenwerke AG in Germany.

Currently, the plant is making 6000 Mercedes 170-based models a year with a staff of about 4000—less than two cars per worker per year. Known as the Shanghai, this car dates from the early '50s and will be gradually phased out as the new model comes in.

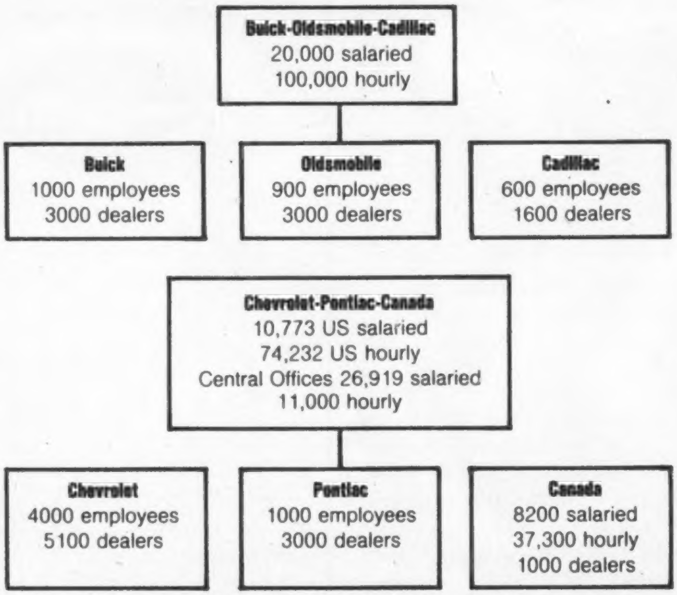
Old and new: the Mercedes 170-based Shanghai and its replacement, the VW Santana (Quantum in the US).

According to Paul Josef Weber, VW's director responsible for the group's subsidiary companies, the new Santana project will be far less complex than the Shanghai operation. While almost 100% of the Shanghai was of Chinese origin, domestic content of the Santana will, for

(Continued)

General Motors

GM's OEM/Dealer Employee Balance Tips



Buick-Oldsmobile-Cadillac
20,000 salaried
100,000 hourly

Buick
1000 employees
3000 dealers

Oldsmobile
900 employees
3000 dealers

Cadillac
600 employees
1600 dealers

Chevrolet-Pontiac-Canada
10,773 US salaried
74,232 US hourly
Central Offices 26,919 salaried
11,000 hourly

Chevrolet
4000 employees
5100 dealers

Pontiac
1000 employees
3000 dealers

Canada
8200 salaried
37,300 hourly
1000 dealers

All figures are approximations; some employees not yet re-deployed

When GM chopped-and-channeled its car divisions into the present corporate flow-chart, the stated reorganization goal was efficiency through consolidation—'to make two mini-General Motors,' according to Chevrolet-Pontiac-Canada head Lloyd Reuss. By blending the five once-powerful car divisions, speedier decision-making would result—or so went the theory.

But a strange thing happened in the wake of all this division-shuffling. Now there are more dealers than car division employees—or so it seems. Who would have imagined the day when Chevrolet would end up with 8/10ths of an employee per dealer? Or when Oldsmobile and Buick would have a third of an employee for every store? Here are GM's new approximate numbers.

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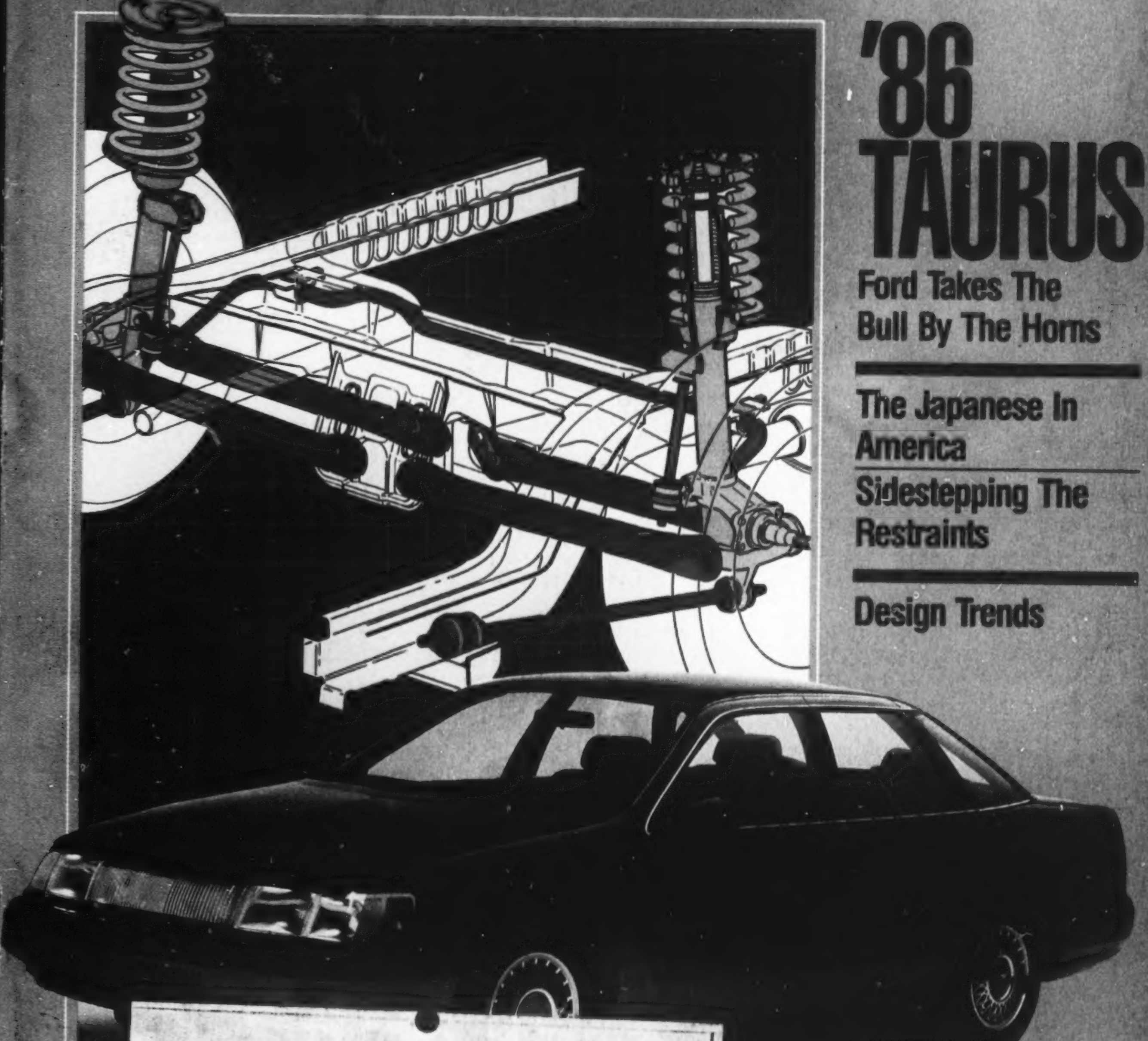

'86 TAURUS

Ford Takes The Bull By The Horns

The Japanese In America

Sidestepping The Restraints

Design Trends

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COVER

Ford's radical new project Taurus is featured this month. The car is the Mercury version, the Sable.

NEXT MONTH

April brings specs galore, plus *AI's* own report card on the industry, our 1985 Total Car Coefficient and more.

QUOTABLE

"A Porsche is like a mink coat, which is there to not necessarily keep a woman warm, but quiet."—Peter Schutz, president and CEO of Porsche AG, on why the recent change in US federal tax laws limiting business writeoffs for automobiles shouldn't hurt Porsche sales.

"I think Americans realize they're mortgaging their kids' future now. Our jobs are going overseas like never before. We're fast becoming a colony again. In spite of our recent prosperity, we're going to have to come down to earth sometime soon."—Chrysler chairman Lee A. Iacocca.

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BUILDING AN AMERICAN EMPIRE

Forget the Quotas. Even if import restraints remain at today's levels, Japanese automakers will be able to increase their US market share 50% by 1990.

Japanese in America 1990 market potential: a conservative estimate of the total cars Japanese automakers could sell in the US by 1990 shows they could boost their market penetration over 50%. This chart is based on the 1984 voluntary import restraint agreement remaining in effect at the current level: 1,850,000 cars plus 90,849 commercial wagons and vans. Toyota's projected US production does not include NUMMI.

by John McElroy

Forecasting can be risky business. Especially if you're trying to guess what will unfold five years from now. But sometimes you can paint a fairly accurate picture simply compiling what different companies say they will do, then analyzing what actions that will force others to take.

Using this logic, it seems safe to say the Japanese automakers will be building over 1 million cars in the United States by 1990. And when that's added to the cars they're able to import from Japan under the Voluntary Restraint Agreement (VRA), they'll have a total of 3 million cars to sell here. If this volume were available today, for example, the Japanese automakers would capture 29% of the American car market.

Should this scenario unfold, the advent of Japanese production in the United States is bound to have a dramatic impact on the domestic automakers, their suppliers and the UAW. For the American car companies, it will provide intense pressure to become more competitive or risk the certain loss of more market share. The supplier industry will be tightly squeezed as Japanese suppliers follow their parent companies into this market and look for increased business by selling components to American automakers. And the UAW will have its hands full just trying to organize the workers at these assembly and supplier plants.

Keeping The Quotas

The question weighing on everyone's mind in Detroit these days is whether the VRA, or some form of "gentlemen's agreement" will continue to restrict the number of Japanese imports. And if so, at what level and for how long? Though the answer may come out before this issue does, *Automotive Industries* contacted the Secretary of Commerce, Malcolm Baldrige, to get a reading of how he is currently leaning. Though he never came out and directly stated that quotas should continue, he left no doubt that he believes the domestic industry is still not as strong as it should be.

"Yes, the US auto industry has recovered from the 1980-82 recession," Baldrige said. But he added, "the companies are not yet completely healthy."

Baldrige pointed out that working capital towards the end of 1984 was still $3.3 billion short of what it was at the end of 1978. And though the companies' leverage has improved, their debt to equity ratio is still higher than it was then.

"These factors, coupled with heightened foreign competition, are an indication that the companies' financial strength has not been fully restored to 1978 levels," Baldrige said. "We will be evaluating these factors as we analyze the need for continued restraint."

Based on Baldrige's response, it seems likely that there will be pressure from Washington to continue the quotas. However, many industry observers believe the anti-protectionist Reagan Administration could allow the formal Voluntary Restraint Agreement to lapse and replace it with an informal "gentlemen's agreement" that would achieve the same purpose. Presently, the VRA limits Japanese imports to 1.85 million cars plus another 90,800 commercial station wagons and vans. But some observers think that some modest quota increase is possible, particularly for Isuzu and Suzuki.

Empire Building: Japanese US Auto Production
(thousands of units)

1983	1984	1985E	1986E	1987E	1988E	1990E
50	134	250	470	670	900	900

Source: Daiwa Securities Co., Ltd.

US Trade Representative William Brock at presstime had reportedly indicated he continues "to question the value of the restraints."

Who's Here, Who's Coming

But even if the VRA continues, the Japanese automakers have plans in place to increase their market share in the United States by making cars here. Honda already has the capacity to build 150,000 cars a year in Ohio and has announced plans to double that. Nissan will start building Sentras this month in Tennessee with the capability of making 100,000 cars a year. Mazda has begun to construct a plant in Michigan that will make 240,000 cars a year, with some of that production being sold to Ford. And these actions are likely to spur others to do the same.

"The Japanese automakers are caught in a game that's called 'Don't let Congress get you,' " says Jim Harbour, a manufacturing consultant in Berkley, MI. "With the quotas in place, they've got to build cars here if they want to increase their market share.

"But look what happens. Let's say I'm Toyota and I'm the number one Japanese car company in the market here. Then I look over my shoulder and I see that Nissan has just added 100,000 cars on top of its quotas. That's going to make them number one. But Honda is going to pass us both because they've just added 300,000 cars. So if I'm Toyota and I want to stay number one and increase my market share, I've got to put a plant here."

"The same goes for Mitsubishi," Harbour explains. "There's no way they can let Mazda pull away from them. So they've got to put a plant here, too. But since they don't have enough market share yet to justify the volume, they'll sell part of their production to Chrysler, just like Mazda is going to do with Ford. Before it's all over, the Japanese will be building 1 million units in the US."

Harbour's assertion is backed up by Yoshihide Kondo, analyst for Daiwa Securities in Tokyo, Japan. Kondo agrees that both Mitsubishi and Toyota will build cars in the US, adding, "Toyota may take over the [NUMMI] joint venture. Otherwise, Toyota will start car assembly at the second plant in addition to the joint venture."

According to Kondo's own estimates, which are very close to *AI's* (see chart), the Japanese will be able to sell 2,840,000 cars in the US by 1990, with the split going 1.94 million imports, and 900,000 local production. And that's assuming that the VRA remains at its 1984 levels and that domestic content legislation is not enacted.

Supplier Squeeze

This large base of American-made Japanese cars will represent lost opportunities for the US supplier industry, according to several auto analysts. Not only will these American-made cars continue to use a high percentage of parts imported from Japan, but over 30 Japanese suppliers have already followed the Japanese automakers to the United States. And this trend is sure to increase, especially if Toyota and Mitsubishi add assembly plants here.

"As a rule, the Japanese automakers don't deal with American parts producers," says Maryann Keller, an analyst with Vilas Fisher. "By and large they prefer to deal with companies in which they have a vested interest. Most Japanese parts producers are affiliated with one or several auto companies. And once these parts producers gain a foot-hold here they will certainly go after business that is presently controlled by US-owned companies.

"And the American auto companies will welcome that because they

(Continued)

will get better prices," Keller adds. "These auto companies want all the protection in the world, but when it comes to protecting their suppliers, that's the last thing they want. And the American parts industry is not really in a position to do much to protect itself because it is very fragmented and their main customers are against them. They have no spokesgroups, and they certainly have no one in the management of these companies who is visible enough to gain national voice."

Many US suppliers with international experience are reacting to these competitive pressures. But often this means they too are looking for offshore sources to lower their prices. That means the smaller suppliers will come under even greater pressure.

"The suppliers, taken in general, do not have very good international experience. They just don't tend to plan strategically the way offshore suppliers do," says Martin Anderson, a consultant in Cambridge, MA. "They're in for a pretty rude awakening, not just from the Japanese suppliers moving here but also with the European component suppliers gaining inroads selling to all producers here."

In 1981, Japanese car and truck manufacturers projected their OE purchases from American suppliers would reach $300 million, but they still haven't reached even half of that figure. Presently, the United States is running a trade deficit of nearly $3 billion with Japan for OE and aftermarket automotive parts and accessories.

To counter this discrepancy, the Japanese automakers cite the domestic content of the vehicles they build here as evidence of their good corporate citizenship. But much of this information is seriously misleading. For example, Nissan states that 42% of each pickup truck it produces at Smyrna, TN consists of domestic content. But they count the labor of their American workers as part of that domestic content. And the American-based Japanese suppliers that supply Nissan are counted towards domestic content, too. Yet, *Automotive Industries* has found three Japanese suppliers—American Yazaki, Chuo-Yuka and Idemitsu Apollo—that Nissan counts towards domestic content even though these companies don't have manufacturing operations in the US. They only import products that are packaged here. But Nissan counts them as domestic suppliers because of that American value added through handling!

This influx of Japanese suppliers seems to have sounded some sort of alarm in Washington, though it's hard to say what, if anything, may come of it.

"While a significant number of domestic companies now supply the US assembly plants of Japanese producers, our parts industry is concerned that the majority of this business will continue to be served by Japanese parts manufacturers producing in the United States and Japan," says Malcolm Baldrige. "The US government does not oppose this investment, but we are aware of industry complaints of tied or informal arrangements between Japanese auto assembly facilities and Japanese parts suppliers in the United States. We are concerned that such arrangements may not allow sufficient competitive opportuni-

US Production of Parts and Accessories by Japanese-Affiliated Companies

Company	Parent & Group	Plant Location	Product Line	Customers
American Yazaki	Yazaki Corp.	El Paso, TX (Juarex, Mex.)	Wiring Harness	Nissan, Ford
Bellemar Parts Industries Inc.	Honda Motor Co. Sankei Giken Kogyo Co. Tokyo Seat Co. (Honda Group Cos.)	Marysville, OH	Seat assemblies, exhaust systems, catalytic converters, brake lines, wheels and door sashes	Honda of America Mfg.
Bridgestone Tire Mfg. (USA) Inc.	Bridgestone Corp.	LaVergne, TN	Radial tires for heavy-duty trucks and buses. Production of car tires under consideration	Replacement market
Calsonic Inc.	Nihon Radiator Co. (Nissan Group)	Irvine, CA	Air conditioning systems	Nissan Motor Corp. USA
Calsonic Mfg. Corp.	Nihon Radiator Co. (Nissan Group)	Shelbyville, TN	Air conditioning systems and exhaust assemblies	Nissan Motor Corp. USA
Cast Forge Co.	Nippon Light Metal Co. Kelsey-Hayes Co.	Howell, MI	Aluminum wheels, transmission component parts and engine parts	OE supplier
Chuo-Yuka USA	Chuo-Yuka	Pittsburgh, PA	Antifreeze, brake fluid, solvents	Nissan Motor Mfg.
Clarion Corp. of America	Clarion Co. Ltd. (Nissan Group)	Lawndale, CA Nashville, TN	Radio combinations	Chrysler Corp. & Nissan Motor Corp.
Curtis-Maruyasu America Inc.	Maruyasu Ind. Co. Curtis Products Inc. (Toyota Group)	Tracy, CA	Fuel line and hydraulic brake assemblies	NUMMI
Eaton Auto Prod. Mfg. Inc.	Nihon Plast Co. Ltd. (Nissan Group)	Eaton, OH	Steering wheels	Honda of America Mfg.
Fuji Koki America	Fuji Koki Mfg. Co.	Dallas, TX	Expansion valves for air conditioning systems	OE supplier
Hi-Lex Corp.	Nippon Cable Systems	Battle Creek, MI	Control cables for accelerators, clutches hood and trunk release mechanisms, gas filler lids and brakes	GM, Ford, Chrysler IH, Nissan Motor Mfg.
Hitachi America Ltd.	Hitachi Ltd.	Lexington, KY	Electronic sensors, actuator modules, engine management systems	Nissan, other OEM's
Idemitsu Apollo	Idemitsu	Cincinnati, OH	Lubricants	Nissan Motor Mfg.
Izumi Corp.	Izumi Motor Co. Ltd.	Yaphank, NY	Steering wheels and horn pad assemblies	Chrysler, Nissan Motor Mfg., Ford

ties for traditional US manufacturers, especially in those areas where excess US capacity exists."

Despite the influx of Japanese suppliers along with Japanese automakers, the employment outlook for American workers may not be as bright as it first appears. From the UAW's viewpoint, any amount of new jobs are better than none. Yet, as the union has seen at Honda's and Nissan's American plants, it cannot automatically count on representing these workers. And because at least half the components used at these plants will continue to be imported, there will be fewer workers to represent, anyway.

"For every job in assembly, stamping and machining at the Ford Motor Co., there are two jobs done outside at Bendix, Dana, Eaton, Budd and thousands of smaller suppliers," says Dan Luria, a senior researcher at the Industrial Technology Institute in Ann Arbor, MI and currently on leave from the UAW research dept. "The same is true for the Japanese companies that build assembly plants here, but the question is, 'Where will those jobs be?' For the American companies, 95% of those jobs will be in the US. But in the case of the Japanese plants built here, 60% of those jobs will still be in Japan. There's about a 30% employment penalty for American workers."

US Production of Parts and Accessories by Japanese-Affiliated Companies

Company	Parent & Group	Plant Location	Product Line	Customers
KTH Parts Ind. Inc.	Kikuchi Press Kogyo Co. Takao Kinzoku Kogyo Co. Hirata Press Kogyo Co. Hongo Seisakusho Co. (Honda Group Cos.)	St. Paris, OH	Stamped and welded internal structural components	Honda of America Mfg.
Kantus Corp.	Kanto Seiki Co. Ltd. (Nissan Group)	Lewisburg, TN	Plastic instrument panels, radiator grilles, console boxes and front bumpers	Nissan Motor Mfg.
Masland-Hayashi	Hayashi Telempu	Livermore, CA	Carpet	NUMMI
Musashi USA Inc.	Mushashi Precision Industry Co. Ltd.	Battlecreek, MI	Arm bushing and joint assemblies	Ford Motor Co.
NGK Spark Plug Mfg. (USA Inc.)	NGK Spark Plug Co.	Irvine, CA	Spark plugs	replacement market for Japanese-made cars
NOK Inc.	Nippon Oil Seal Industry Co. Ltd.	LaGrange, GA	Oil and mechanical seals	GM, Ford, Chrysler, AMC, IH
Nippondenso of Los Angeles Inc.	Nippondenso Co. Ltd. (Toyota Group)	Long Beach, CA	Air conditioning systems	OE contract with NUMMI. Systems for Toyota and Honda sold here.
Nippondenso Sales Inc.	Nippondenso Co. Ltd. (Toyota Group)	Battle Creek, MI	Windshield washers and heaters	Honda of America
North American Lighting	Koito Mfg. Co. Ltd. Westfalische Metall Industries AG (Toyota Group)	Flora, IL	Front and park lamps, rear combination lamp assemblies, for lamps and license-plate lamps	Nissan Motor Mfg., BMW of North America, Volkswagen of America, Ford, GM and AMC
Sanden International (USA) Inc.	Sanden Corp.	Dallas, TX	Air conditioner compressors	OE and aftermarket
Stanley Electric US Co. Inc.	Stanley Electric Co. Ltd. (Honda Group)	London, OH	Front and rear combination lamps	Honda of America Mfg.
Topy Industries Inc.	Nippon Steel	Frankfort, KY	Car and truck wheels	Nissan Motor Mfg. and OE
Toyota Motor Mfg. USA Inc.	Toyota Motor Corp.	Long Beach, CA	Cargo beds for pickup trucks	Toyota Motor Sales USA
Tri-Con Industries Ltd.	Tokyo Seat Co. Ltd. (Honda Group)	Columbia, MO	Car seats	Chrysler
Viam Manufacturing	Japan Vilene Co. Ltd. Dainippon Ink & Chemicals Inc.	Santa Fe Springs, CA	Floor mats	OE and replacement markets
Warner-Ishi Corp.	Ishikawajima-Harima Heavy Industries Co. Ltd., Borg-Warner Corp.	Shelbyville, IL	Turbocharger housings	OE and aftermarket
Wynn-Kiki Inc.	Diesel Kiki Co. Ltd. Wynn Industries, Inc.	Fort Worth, TX	Air conditioner compressors	OE market

Making Cars in America

Many people in the US auto industry relish the prospect of Japanese production in America. They believe that once the Japanese automakers build plants here, the UAW, the EPA and OSHA will provide 'a level playing field' that will destroy the Japanese competitive advantage. But others are not so certain.

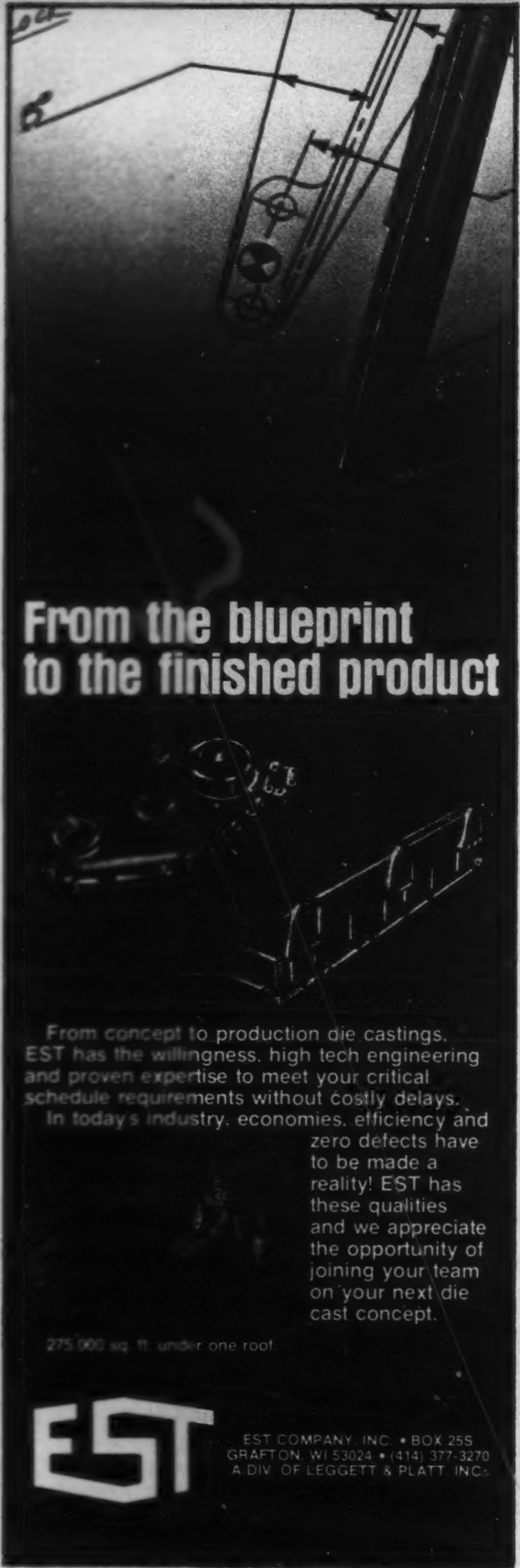
"The EPA and OSHA may be strict, but they're predictable," says Martin Anderson. "The Japanese sell to 100 different nations, and a lot of their governments are not predictable. You do the wrong thing and your boat may sit in the harbor for six months. The Japanese and their suppliers are quite adept at dealing with these challenges. So if somebody is sitting around here thinking the EPA or OSHA are going to be a barrier, they've just made the wrong assessment."

And one question the US automakers have not yet answered satisfactorily is why the Japanese would build compacts and subcompacts in the American market. While the American companies claim they can't build small cars profitably and must source them from Japan and Korea, these are the very cars that the Japanese are building here today.

Part of the answer can be explained by the number of components that are imported from Japan. Another part can probably be attributed to the lack of a union at Nissan's and Honda's plants. But NUMMI is represented by the UAW and Mazda's US assembly plant will be, too. So how do they do it?

"When the Japanese come into the US, they're able to hire an all-new workforce," Jim Harbour explains. "So their pension costs aren't that much of a burden and probably won't be for several decades to come. Plus, they're able to substitute HMO plans for an expensive Blue Cross package.

(Continued)



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And they don't carry any COLA [cost of living allowance] costs. Now, the line worker in one of those Japanese plants still earns the same as somebody in an American plant. But he has one-third the fringe cost. So even though the take-home pay is the same, the labor cost is $5 to $6 an hour less.

"But it goes deeper than that," Harbour adds. "The Japanese have shown that they can build a car here with fewer man-hours of labor than we can. And when you couple their efficiency with their lower labor costs and the parts they bring in from Japan, they can still build a car here for $1500 to $1700 cheaper than any American car company."

The Big Chill

The 50% increase in cars that the Japanese automakers will be able to sell in the US by 1990 will undoubtedly pose a strong challenge to the American automakers. They will be forced to become more competitive or see their market position erode. And though efforts such as GM's Saturn Corporation are likely to meet the challenge by then, you just know the Japanese aren't sitting still.

But the big move on the American market could ultimately hurt the Japanese as well as everyone else that wants to sell cars here.

"I don't think the US market is going to grow fast enough to support the combination of incremental capacity additions from US companies, the million units that you see coming from the Japanese companies and the attention that the Europeans, the Koreans and the Mexicans are giving us," observes Maryann Keller.

"What are you going to do with all of them? Is that going to be the kind of market where profit margins are as high as they are now? That's very unlikely. We could see the same thing develop that's going on in Japan right now, which is that nobody makes any money because of all the fierce competition." ■

Reported by the author, Leo Abruzzese in Washington, and Lance Ealey.

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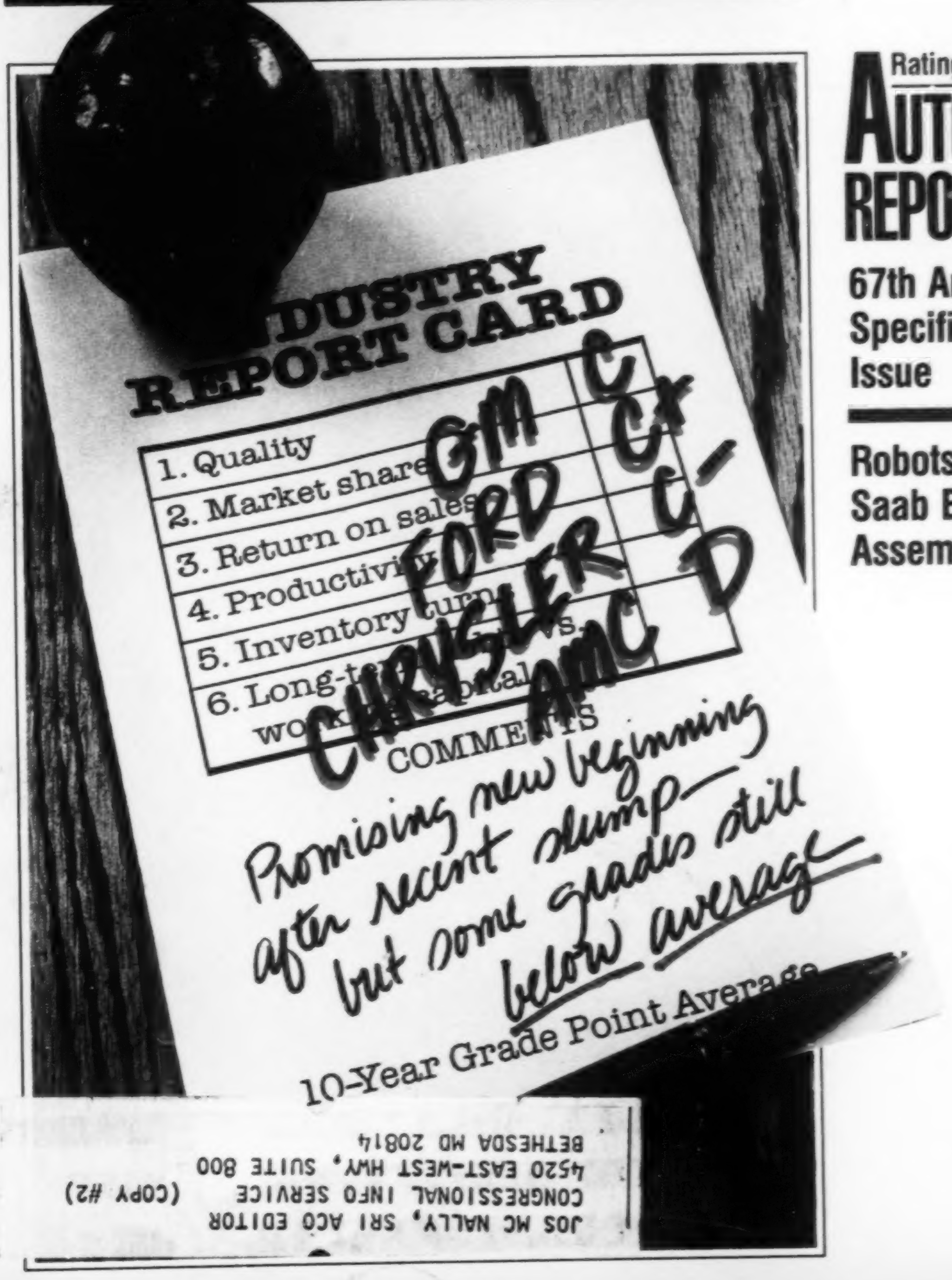
Chilton's TRUCK & OFF-HIGHWAY


INDUSTRY REPORT CARD
1. Quality
2. Market share
3. Return on sales
4. Productivity
5. Inventory turns
6. Long-term ... vs. working capital
GM C
FORD C+
CHRYSLER C-
AMC D
COMMENTS
Promising new beginning after recent slump— but some grades still below average
10-Year Grade Point Average

Rating The Carmakers

AUTOMOTIVE REPORT CARD

67th Annual Specifications Issue

Robots Power Saab Engine Assembly

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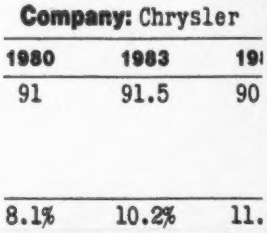
AI's first annual report card on the automotive industry. Grades shown on cover are for 1973-83. For '84 grades, see page 22.

NEXT MONTH

100th Anniversary of the Automobile. Special *AI* extravaganza follows the automobile from its patent in 1885 to today.

QUOTABLE

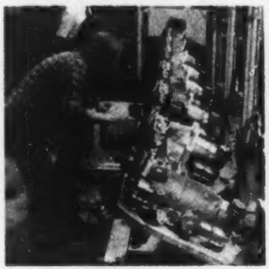
"We're not about to back up because of the Japanese challenge or the Taiwan challenge or the European challenge. This business is just too doggone good and too many people are looking to take it over. So we're here to stay."—Robert Stempel, group VP of GM's Buick-Oldsmobile-Pontiac group.



Company: Chrysler

1980	1983	19
91	91.5	90
8.1%	10.2%	11.

Report Card—p. 22



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MR2	USA	FR
	Metric	
Tercel Liftback	USA	FR
	Metric	
Tercel 4wd Wagon	USA	FR
	Metric	
Corolla (fwd)	USA	FR
	Metric	
Corolla GTS Sport Coupe	USA	FR
	Metric	
orolla GTS Sport hatchback	USA	FR
	Metric	
Camry	USA	FR
	Metric	
Celica GT & ST	USA	FR
	Metric	
Celica GT-S	USA	FR
	Metric	

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FIRST ANNUAL INDUSTRY REPORT CARD

Who's passing, who's flunking, who's clapping erasers after school—find out as AI grades the US automakers' performance for 1984, the most profitable year in history. Is the industry really doing better than ever?

Company: General Motors

Category	1973	1978	1980	1983	1984	Grade	Comments
Quality	--	--	86.4	82.6	91.2	C	Performing below abilities. Spending time and pocket money buying high-tech answers to quality problems, though apparently lacks overall strategy to integrate these into a ''quality first'' manufacturing philosophy.
Market Share-US	51.5%	47.3%	41.6%	41.5%	39.1%	F	Has lost 10% of market share in 10 years. Losing the leadership clout that made GM BMOC (Big Marketer On Campus).
Return on Sales	6.7%	5.5%	(1.3%)	5.0%	5.4%	C	Coming back strong from only failing year (1980), but over a percentage point off 1973 levels.
Productivity	11.4	12.0	10.3	11.7	11.5	C	Very little change in 10 years. See remarks under quality. Tsk, Tsk.
Inventory Turns	5.4	6.7	5.7 10.1*	7.0 11.0*	7.3 10.3*	C+	Satisfactory performance overall. Slight wheeze in 1984 though.
Long Term Debt vs. Working Capital	1.00 8.20	1.00 8.10	1.00 1.60	1.00 1.90	1.00 2.60	B-	True, still not as good as before, but at this point, best in class.
					Overall Grade	C-	

***—Includes work-in-progress, raw materials, supplies.**
Return on Sales: Profit as a percent of gross income.
Market Share: Car and truck percentage of domestic market.
Productivity: Vehicles per employee per year.
Inventory Turns: Same as days' supply. The more turns the fewer days' supply.
Long Term Debt vs Working Capital: Measures money on hand versus money owed.

A=Outstanding achievement

B=Moving ahead

C=Going nowhere

D=Falling behind

F=Failing

Company: Ford

Category	1973	1978	1980	1983	1984	Grade	Comments
Quality	--	--	90.5	110.5	113.6	A	Shows tremendous growth in problem-solving. Attacks quality problems from a surprisingly Oriental angle.
Market Share-US	29.8%	26.5%	18.7%	21.6%	22.7%	B	Overall market share has dropped since '73, but improvement since '80 shows good progress.
Return on Sales	3.9%	3.7%	(4.1%)	4.3%	5.5%	B	Good growth pattern since 1980. Sort of puts those ''obscene profits'' in perspective, doesn't it?
Productivity	13.7	13.7	11.5	14.3	15.9	A	Excellent! The slogging, hard work in this area is really paying off.
Inventory Turns	5.3	6.5	5.8 9.6*	7.4 12.2*	8.6 14.2*	B+	Solid improvement over the years.
Long Term Debt vs. Working Capital	1.00 1.70	1.00 2.70	4.20 1.00	5.40 1.00	1.50 1.00	F	The improvement since 1983 shows steady progress, but this is still a dangerous debt level.
						Overall Grade	B-

*—Includes work-in-progress, raw materials, supplies.
Return on Sales: Profit as a percent of gross income.
Market Share: Car and truck percentage of domestic market.
Productivity: Vehicles per employee per year.
Inventory Turns: Same as days' supply. The more turns the fewer days' supply.
Long Term Debt vs Working Capital: Measures money on hand versus money owed.

A=Outstanding achievement
B=Moving ahead
C=Going nowhere
D=Falling behind
F=Failing

by John McElroy

It looks like 1984 could be remembered as the most profitable year in the history of the American auto industry. And the numbers look even better when reflected in the dismal light of just three years ago. But what wouldn't look good compared to the disastrous 1980-82 depression? So, to see if there really has been an improvement, we decided to take a look at the industry's performance over the last 10 years.

Not Many 'A's

To keep things from turning into a Gordian knot of corporate economics, we chose six categories that measure the overall efficiency of each company. And each company was graded against its own performance during the last decade. Since we subscribe to the 'three Rs' school of economics (reap, reinvest and recoup), it is very difficult to get an 'A' in this class. To do so, the student, er, company, must show outstanding achievement from year to year. But as long as it showed steady improvement, a 'B' was awarded. A company which showed virtually no improvement was given a 'C'. And when it fell behind its previous achievements, it was given a 'D'. Any company which fell behind at an alarming rate was given an 'F'.

We chose 1973 as a base year because that's when the industry posted its best sales. Also, 1973 represents the last year the industry could operate without the disastrous stresses of energy crises, intense foreign competition and excessive government regulations. So any 1984 figures which are better than 1973's represent a big step forward.

Next, we chose 1978 as a comparison year because it represents (until now) the most profitable year in the industry. And 1980 is used as the best representation of the worst of times. It shows just how bad things got, and how much they've improved since then. Next, we have 1983 figures to compare the year-to-year improvements with 1984.

Our different categories are designed to measure the overall efficiency of each company, so that we could negate the effects of inflation and be able to compare one company to another.

The Results

Our **quality** rating is based on J.D. Power's Customer Satisfaction Index which is a survey of consumers who have owned their cars for a year. So

(Continued)

Industry Report Card

Company: Chrysler

Category	**1973**	**1978**	**1980**	**1983**	**1984**	**Grade**	**Comments**
Quality	--	--	91	91.5	90.3	D	That apple you gave me had a worm in it...better bone up on SPC and defect prevention
Market Share-US	15.6%	11.2%	8.1%	10.2%	11.0%	B-	Has leaped back from what seemed certain expulsion, and progress in building market share since 1980 is very encouraging.
Return on Sales	2.1%	(1.5%)	(18.5%)	5.3%	12.4%	A+	Outstanding! Lee and his gang have gone from delinquents to demagogues in five short years. Even if they had paid a full tax load the results would be fantastic.
Productivity	13.0	13.0	11.0	16.4	18.5	A+	Incredible! But why fluff an already excellent mark by claiming 20 cars per employee?
Inventory Turns	5.6	6.3	4.7 6.4*	8.3 12.8*	9.4 14.2*	B+	Efforts to trim inventories have really taken off since 1980.
Long Term Debt vs. Working Capital	1.00 1.20	1.00 1.10	2.4 bil. 0	1.1 bil. 0	760 mil. 0	F	For a company that was nearly expelled, things look better, but this debt must be reduced.
					Overall Grade	C+	

***—Includes work-in-progress, raw materials, supplies.**
Return on Sales: Profit as a percent of gross income.
Market Share: Car and truck percentage of domestic market.
Productivity: Vehicles per employee per year.
Inventory Turns: Same as days' supply. The more turns the fewer days' supply.
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D=Falling behind
F=Failing

the 1984 results are based on 1983 models and so on down the line (we put their 1982 results in our 1980 column). Because it was able to show significant improvement from year to year, Ford was awarded an "A" for quality. But this grade was based on Ford's own performance, and not how it compared to other companies.

Actually, Mercedes-Benz has consistently been rated the best by the J.D. Power survey. And though many people in the industry find fault with this survey, we feel the overall trendline is accurate.

We chose **marketshare** as a measure of the company's long-term strength. Obviously, whoever gets a bigger share of the market on an ongoing basis must be doing something right to keep those customers coming back and attract new ones.

Underachieving GM

We have to admit it was a shock to learn that General Motors has lost 10% of its marketshare (car and truck) over the last 10 years. Ford and Chrysler have also lost much of their market too, but at least they have improved their positions since 1980. General Motors continues to fall behind.

Return on sales measures the percent of money a company got to keep out of all the money it took in during the year. This is one category where the domestic companies outperform all foreign automakers, even Mercedes-Benz and Toyota. Keep in mind that Ford and Chrysler didn't pay any taxes in 1983 or 1984, so this helped them score higher.

Nonetheless, Chrysler's return on sales for 1984 is so outstanding that it still would have earned an 'A' even if the figure had been cut in half.

Our measure of **productivity** looks at how many cars and trucks a company builds in a given year, and how many employees (blue collar and white collar) it needed to build them. The resulting figure is: vehicles per employee per year. A word of caution

Company: American Motors

Category	**1973**	**1978**	**1980**	**1983**	**1984**	**Grade**	**Comments**
Quality	--	--	81	76	51.5	F	A "new beginnings" lecture seems appropriate right about now.
Market Share US and Canada	3.5%	2.3%	2.1%	2.7%	2.8%	C	Some improvement since 1980, but is this because of Jeep sales, not cars?
Return on Sales	4.3%	1.4%	(7.7%)	(4.5%)	.36%	C+	Good turnaround since '80, but, again, are strong Jeep sales the reason?
Productivity	18.2	17.1	18.5	16.8	18.1	C	Not much change since '73, but you've regained much of the productivity lost since '83.
Inventory Turns	7.2	6.4	5.8	6.3 12.0*	7.6 15.3*	C	Best turns in class but not much improvement in 10 years
Long Term Debt vs. Working Capital	1.00 2.78	1.00 1.27	1.00 1.28	394 mil. 1.00	590 mil. 1.00	F	This debt burden must be reduced.
					Overall Grade	D	

*—Includes work-in-progress, raw materials, supplies.
Return on Sales: Profit as a percent of gross income.
Market Share: Car and truck percentage of domestic market.
Productivity: Vehicles per employee per year.
Inventory Turns: Same as days' supply. The more turns the fewer days' supply.
Long Term Debt vs Working Capital: Measures money on hand versus money owed.

A = Outstanding achievement
B = Moving ahead
C = Going nowhere
D = Falling behind
F = Failing

here. Though Chrysler has the highest figure for productivity, for proper comparison you must remember that it also outsources 70% of its components, while Ford outsources about 50% and GM only 30%. Nonetheless, even if we factor in outsourcing, Chrysler still outperforms GM, though Ford then overtakes Chrysler.

Astounding Toyota

Despite Ford's and Chrysler's productivity improvements, however, they still are not competitive on a worldwide basis. Toyota, for example, makes 66.7 cars per employee per year, with a level of outsourcing that is the same as Chrysler's.

Inventory turns are a measure of how well a company is implementing a just-in-time (JIT) production system. The more turns, the more effective the JIT system. And since a more effective JIT system positively affects quality and productivity, it also helps measure a company's manufacturing efficiency. Note that the post-1980 figures look better than the pre-1980 figures. Before 1980 the companies lumped all their inventory into one figure. But now they break it into work-in-process (WIP), raw materials and supplies, and finished goods.

But finished goods really don't have anything to do with JIT production. To provide a complete comparison, total inventory turns less finished goods are added in parenthesis. All the domestic automakers have improved their inventory turns, but they are still no match for Toyota which has an astounding 90 turns a year!

Long term debt versus working capital is used to show how leveraged a company is, which helps demonstrate if it can continue capital expenditures without having to borrow the money. General Motors easily outperformed its domestic rivals in this category—Ford and Chrysler are still in debt despite recent improvements.

Some readers may wonder why Chrysler has no working capital, even though the company boasts of a war chest holding $1.7 billion in cash and securities. This is because Chrysler also owes $2.3 billion in accounts payable. If those accounts were called due tomorrow, that cash would disappear.

Nonetheless, Chrysler (and Ford) are quickly reducing their long-term debt. But to become totally competitive on a worldwide basis, all the domestic manufacturers have a long way to go to catch Toyota, which has absolutely no long-term debt and finances all its expenditures from its working capital. ■

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The End of the Quotas and the US Economy

by **Thomas F. O'Grady**

A modest relaxation of the Japanese Voluntary Restraint Agreement, by an additional 200,000 cars each year, could decrease nominal GNP by $9.77 billion and real GNP by $2.7 billion. Now that the VRA has been allowed to expire, the impact on the US economy and specifically the auto industry seems an appropriate topic for the April issue of *Automotive Industries.*

The impact of the Japanese restraint relaxation on the US economy is not insignificant. In a recent study, an increase in imports of 200,000 units is assumed in the first year after the agreement expires. In the second and third years, increases of 400,000 and 600,000 are expected.

By the end of 1987, the already burgeoning trade deficit would be increased by over $6 billion. Industrial production would fall by 0.3%.

Employment would suffer by 150,000 jobs. US auto producers have increased employment from about 657,000 in 1983 to 720,000 in 1985. Over the next three years, it would probably fall by 50,000 to 70,000 jobs, the remainder of the drop being in auto supplier and other auto-related jobs.

Real prices would decline by 4% to 6%, the decrease mainly being on the smaller cars that are directly competitive with the Japanese. A real price decrease would primarily be brought about by the importation of both lower-priced small cars and current-priced models with fewer options. Prices would decrease by a lesser amount on larger cars.

Thomas F. O'Grady is the director of the Chase Econometrics Automotive Service. He provides market research and market projections to leading companies worldwide.

According to a recent study, the following carlines and plants would bear the brunt of increased Japanese import penetration: AMC/Renault's Alliance/Encore built in Kenosha, WI; Chrysler's Omni/Horizon and Reliant/Aries built in St. Louis, MO, Newark, DE and Belvidere, IL; Ford's Escort and Lynx made in Edison, NJ and Wayne, MI; the GM Skyhawk, Chevette, Cavalier, Citation and Firenza built in Lakewood, GA, Jonesville, WI and Leeds, MO; and the VW Golf made in New Stanton, PA. Depending on the competitiveness of individual carlines and companies, each plant would be affected differently, but certainly outsourcing by domestics will increase and, as local content declines, US suppliers will be adversely affected. The relaxation of auto quotas would probably see increased allotments to the beleaguered smaller Japanese companies which were late in coming to the US market and were planning and organized to sell more autos than their current allotments.

The Japanese have the production capability to export a substantially greater number of cars than they have been allowed—as many as 700,000 units, seasonally adjusted at annual rates, within 18 months. However, even though the VRA will soon be allowed to expire, they will likely continue some form of self restraint, probably administered through the Ministry for International Trade and Industry (MITI). Fear of a protectionist reaction will moderate potential import increases. A 10% to 15% increase would not be considered excessive, and may prove necessary for the smaller Japanese companies.

With smaller overall allotments permitted, Isuzu, Suzuki and Subaru have the greatest potential for gain. In the case of Isuzu and Suzuki this is important to ensure an adequate marketing and financial presence in the US.

Simultaneous with the lifting of the restraints, Daewoo of Korea will export 100,000 cars to the US and Hyundai, said to be opening US dealerships in September, will also be exporting about 100,000 cars. In light of this Korean deluge, it must be difficult for MITI to justify the current allotments to Japanese companies with less than 100,000 units. Current allotments are 75,800 for Subaru, 50,000 for Isuzu and 17,000 for Suzuki.

The current stability of the auto market in Japan and tight restraints on the European market make the US market very attractive for the Japanese. Expiration of the VRA makes it even more so. ■

EFFECT OF QUOTAS' END ON THE US ECONOMY

	1985				1986				1987			
	1st QTR	2nd QTR	3rd QTR	4th QTR	1st QTR	2nd QTR	3rd QTR	4th QTR	1st QTR	2nd QTR	3rd QTR	4th QTR
GNP (billions)	$3830.70	$3913.47	$3985.44	$4041.73	$4090.23	$4167.41	$4248.98	$4339.53	$4437.0	$4523.22	$4612.28	$4709.52
*Change (billions)	—	-$.27	-$.72	-$1.43	-$2.10	-$3.0	-$3.80	-$4.63	-$5.61	-$6.92	-$8.63	-$9.77
Real GNP (billions 1972 $)	$1674.49	$1690.52	$1704.94	$1709.38	$1714.56	$1728.20	$1744.56	$1760.25	$1778.77	$1792.59	$1807.45	$1823.27
*Change (billions)	—	-$.09	-$.25	-$.49	-$.70	-$.97	-$1.18	-$1.40	-$1.66	-$2.01	-$2.36	-$2.67
Trade Deficit (current dollars)	-$103.18	-$100.63	-$109.44	-$111.01	-$118.36	-$121.25	-$126.93	-$130.16	-$132.78	-$137.44	-$141.67	-$147.23
*Change (billions)	—	-$.24	-$.63	-$1.12	-$1.64	-$2.32	-$3.06	-$3.59	-$4.15	-$4.91	-$5.68	-$6.27

*Change denotes the difference between what would happen with and without the relaxations of the VRA.

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AUTOMOTIVE INDUSTRIES

NUMBER ONE IN THE INDUSTRY SINCE 1895

Special Issue

100 YEARS OF THE AUTOMOBILE

How It All Began

The Name Game

Top 40 Cars

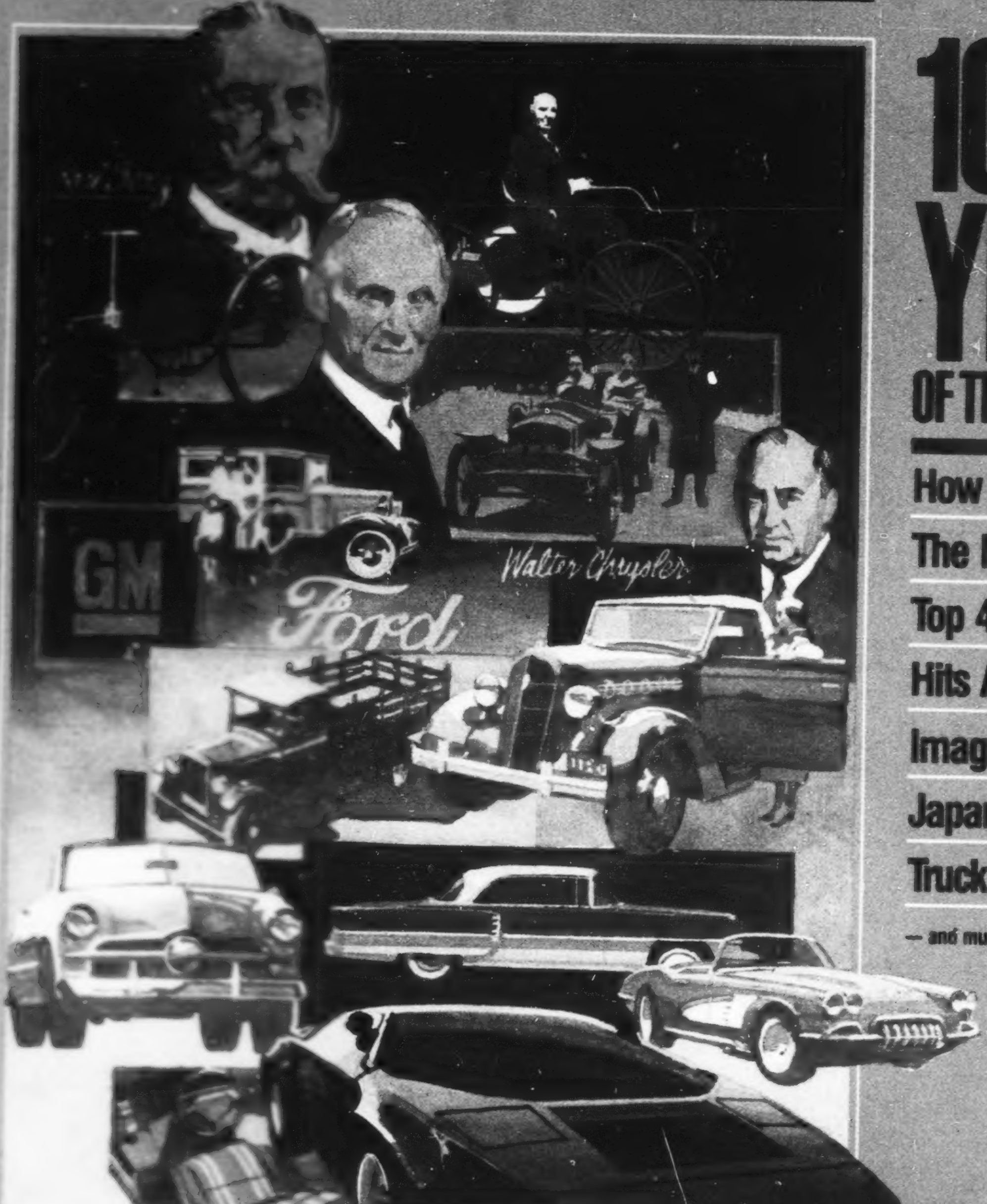
Hits And Misses

Image Makers

Japan's Rise

Truck History

— and much more —



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100th Anniversary

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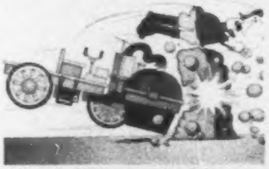
"It's a senseless waste of time."—Siegfried Marcus, Austrian inventor, who predated Benz and Daimler by over 15 years in the development of the internal combustion engined carriage, on the future of such contraptions (see page 61 for more of Marcus' exploits).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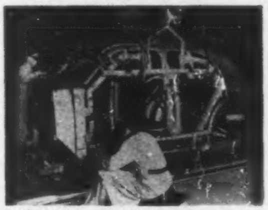
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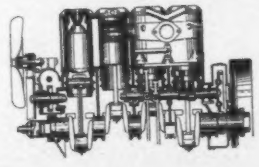
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AS YOU SEE IT: TOP 40 CARS THROUGH HISTORY

We asked a random sampling of our readers for their opinions of the significant happenings in auto industry history. Here's what you said.

by Jennifer G. Mintzer and Mary Ann Angeli

In an effort to involve you, our readers, in our 100th Anniversary of the Automobile issue, *AI* sent some of you (a random sampling) questionnaires asking for your choice of the top three manufacturing and technical advances in the auto industry, as well as the top ten vehicle models worldwide over the past one hundred years (1885-1985).

While our original questionnaire asked for your perceptions as to the ten most significant cars ever to appear worldwide, the enthusiastic response was overwhelming. We received thousands of returns, with hundreds of cars nominated for a spot in the top ten.

Top 40 Cars

Therefore, we present herewith, in order of numbers of mentions, a list of the top 40 most significant cars along with some of the rationale as perceived by a broad sampling of *AI* readers. We have lumped some models together since the reasons given for each were nearly identical, i.e., various model years of Thunderbird, Lincoln and Corvette.

Tops on the list of technical advances with 24.3% of your vote, was the automatic transmission, a 1904 invention (Sturtevant), "responsible for making driving simple" and for allowing the not-so-terribly-coordinated to drive. Next in line with 19.3% of the vote came electronics, including electronic engine controls, electronic ignition, on-board computers and electronic emissions controls.

Your third pick with 16.8% of the response was the electric self-starter, developed by Kettering and introduced in a Cadillac in 1911.

The assembly line snagged 30.9% of your vote for the top manufacturing advance during the past century. Robotics, with 26.6% and automation with 9.3% of your vote, placed second and third. Whereas the assembly line "made the price of the car feasible for the masses," robots provided "good quality independent of the human element."

The task of selecting the top vehicles worldwide was a tough one for many of you. Most of you based your choices on the idea that these vehicles contributed to the overall advancement of the automotive industry, were "quality-built for the money spent," and "presented a level of luxury, convenience and satisfaction that pioneered their own era."

Model T First

Ford's Model T claimed first place in our survey, while the Chevy Corvette came in second. In fact, Ford cars dominated the top 10 of our top 40 models. The Models A and T won "for assembly line principles," "bringing transportation to the masses," "making the auto affordable," and "putting America on wheels."

Another Ford model which won a large chunk of your vote was the '55-'57 Thunderbird: "a special car for young people," "the first personal luxury car," and "an evolution from a tiny two-seater to today's aerodynamic model and everything in between."

The Mustang (1964) was said to "start a new generation of cars for young people," called "the first affordable American sports car," "ultimate performance car," "most imitated car," and the "best post-war marketing attempt by a US maker."

Ford's Edsel (1957) was named "the most famous failure." The 1932 Ford V8 was claimed to have "launched hot rodding," "popularized the V8 in the US," and given "Joe Average his first taste of a rich man's world."

You liked the '55 Chevy because it was the "first high production sedan to be accepted in the market." The Corvette (1953) won your hearts because it led plastics technology, was the "first bold move outside the mainstream by a Big Three maker," and was "America's answer to Europe on the luxury sports car."

On the other hand, the Corvair (1960) was picked because it "gave rise to NHTSA with Nader as midwife," and "paved the way for Nader's Raiders that started the many aspects of safety in vehicles."

Volkswagen's Beetle came in fourth. Some of you called it the "people's car," "simple and cheap," and the "first reliable worldwide small car." It was lauded for its low-maintenance air-cooled engine, its simplicity, low price, versatility, reliability, dependability and for being a worldwide sales phenomenon.

Chrysler's Airflow (1934) was judged "years ahead of its time," the "original aero car," the "first car with modern proportions," and a "pacesetter for streamlined cars." The K-cars (1981) received votes because they "showed that if a worker on the line got a good kick in the ass he could build a car the public would buy." Plus the Ks "saved Chrysler."

Mercedes Fifth

Mercedes-Benz came in fifth for "innovation," "high engineering standards for the world," and "the most copied designs." The Gullwing (1955) took the fancy of most because it "inspired sports/luxury cars with its classic design."

Pontiac's Fiero (1984) was called "a new direction for US auto history," the "newest use of plastics," and a "tremendous opportunity for fre-

Your Choice for the Top Forty Cars of History

Car	Why You Voted for It
1. Ford Model T	"For assembly line principles and bringing transportation to the masses; made auto affordable; changed concept of transportation; car for the common man; Model T put America on wheels, VW Beetle put world on wheels."
2. Chevy Corvette	"Led in plastics technology; first bold move outside of mainstream by a Big Three maker; first true American sports car; '65 model had disc brakes; introduced new concepts of suspensions, engines, and body; '84—state of the art."
3. Ford Mustang	"Started new generation of cars for young people; affordable American sports car; ultimate performance; best post-war marketing attempt by US maker; most imitated car; fuel economy."
4. VW Beetle	"People's car; simple and cheap; granddaddy of fuel-economy boxes; right car at the right time; most versatile power plant; simplicity and versatility made it long-lived; first reliable worldwide smallcar; changed US attitude toward small car; worldwide phenomenon."
5. Mercedes 300SL	"Innovative; set high engineering standards for the world; Gullwing inspired sports/luxury closed cars; Gullwing—spaceframe, fuel injection, classically designed sports car; sustained high standards; 300SL superior machine for its time; designs most copied."
6. Ford T-Bird	"First personal luxury car, what an evolution from tiny two-seater to today's aerodynamic model; reliability."
7. VW Rabbit	"First modern economy sporty sedan; everyone copied."
8. Rolls Royce	"Nothing exceeds like excess; workmanship, highest quality, sets world standards, pure luxury; speaks to quality and excellence."
9. Model A	"Worthy successor to the T."
10. Cadillac	"Proving ground for luxury features; American standard; 1927 LaSalle first car to be officially styled which began a tradition for world auto industry; 1930 Caddy V16—state-of-the-art, stunningly engineered, first hydraulic valve lift."
11. Pontiac Fiero	"New direction for US auto industry; newest use of plastics; application of mill and drill; use of existing production components; open-ended car concept; plastic body and new manufacturing techniques; unbeatable for price and styling; tremendous opportunity of frequent inexpensive exterior styling changes; multiple unique entries off one platform."
12. Lincoln	"Ride qualities ('73 Town Car); Mark series most beautiful cars in the world evolved around this series."
13. Cord	"Unitized body, front-wheel-drive; best US pre-war design; electric shift; folding headlights; fwd innovator 50 years before its time."
14. Chrysler Airflow	"Years ahead of its time; original aero car; first car with modern proportions; unitized body; set pace for streamlined cars."
15. Porsche	"Invented Beetle; air-cooled engine and best high performance sports car today; engineering, performance, and handling."
16. Austin Mini	"First mass produced development of transverse front-wheel-drive small car; new idea on passenger space; started fwd mini-car era."
17. Jaguar XKE	"Highly powered sports car; beautiful design and comparatively cheap; distinctive styling."
18. Corvair	"Ushered in safety era; gave rise to NHTSA with Nader as mid-wife; unique product tied to rise of consumerism; spawned auto safety; unique radical design; first economy car by the Big 3; led to first safety regulations; air-cooled rear engine; innovative use of aluminum; started personal car fad; first turbocharged production car; bold engineering; controversial."
19. Jeep	"Standard for all four-wheel-drive vehicles to come; an enduring love affair; war horse; four-wheel-drive for the masses."
20. 1955 Chevy	"First high production sedan to be accepted in market; light weight, high performance V8 available."
21. Oldsmobile	"Curved dash Olds first affordable car; Olds '40 first automatic transmission of current design."
22. Ferrari	"One of three most wanted dream cars."
23. Duesenberg	"First supercharged engine; the standard for quality; influenced future design; took the auto out of transportation and into mobile art."
24. MG	"Started sports car enthusiasm in US; launched sports car craze; first successful sports car in the US; classic design, affordable price."
25. 1932 Ford V8	"Launched hot rodding; popularized V8 in US, first low cost V8; gave Joe Average his first taste of rich man's world."
26. Honda	"Made it simple."
27. Studebaker	"Ageless beauty; '53 Studebaker precursor of today's styling; Lark—right car, wrong market/marketing; '46 a styling leader."
28. Pontiac GTO	"First muscle car; symbol of US performance; golden age muscle car; started performance cars; low buck, high performance excess."
29. Toyota	"Japanese quality entry into US; best selling car in the world."
30. Edsel	"Most famous failure; most infamous car ever produced; taught world need for marketing skills."
31. Stanley	"The Stanley Steamer set early standards in reliabilty, speed, power."
32. Tucker	"First rear-engined car with many features later copied; forerunner of utility and ideas."
33. Olds Toronado	"First American high volume front-wheel-drive; high priced personal car."
34. DeLorean	"Proves an independent can't make cars alone; well enough put together to prove that a small group still has a chance at the big time."
35. Packard	"Could have been the American Mercedes-Benz; refinements; excelled in performance and image."
36. Audi	"Successful development of truly efficient unit body structure to mass produce car."
37. Hudson	"Many new design ideas; comfortable; very fast car in the '50's; first with step-down interior; revolutionized frame-type construction."
38. Citroen	"Aerodynamics; suspension; novelty for long production runs; first mass production to realize full potential of aerodynamics."
39. Chrysler K-Cars	"Saved Chrysler; showed that if a worker on the line got a good kick in the ass he could build a car that the public would buy."
40. Mazda	"Japan's answer to the world on performance, quality, luxury, and price; changed image of Japanese cars; rotary engine."

quent inexpensive exterior styling changes." The Pontiac GTO (1964) was praised as the "first muscle car," and as a "symbol of US performance." Rolls-Royce made it into the top ten because "nothing exceeds like excess." Cadillac made it to tenth place because it is a "proving ground for luxury features," and an "American standard."

Lincoln's Mark series were called "the most beautiful cars in the world." You especially liked the curved dash Olds (1900-05)—"the first affordable car,"—and the Toronado (1966)—"the first high volume front-wheel drive, high-priced personal car."

The Austin Mini, which you claimed started the front-wheel-drive mini-car era, was a "new idea in passenger space" with its transverse engine. The Cord (1936) with fwd and unique styling was "50 years before its time."

The Citroen was named the "first mass production model to realize the full potential of aerodynamics." The DeLorean (1983), you said, "proves that the little guy can't start his own auto company." But he can try a few businesses on the side.

Duesenbergs set "the standard for quality," and "took the automobile out of transportation into mobile art."

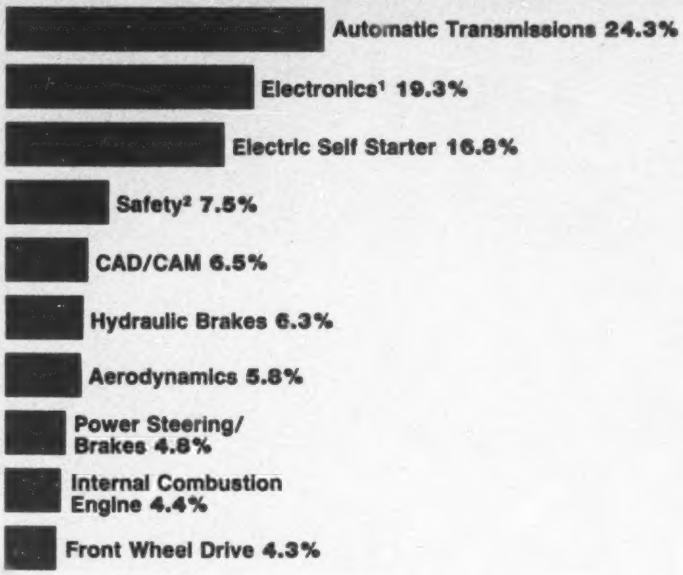
You said the Hudson's (1948) "step-down design revolutionized frame type construction" and its "straight 8 could keep up with today's cars in 0-60 mph times."

You're having "an enduring love affair" with the Jeep, you like the MG for "its classic design at an affordable price."

Mazda, you claim, is "Japan's answer to the world on performance, quality, luxury and price," and Toyota is "Japan's first quality entry into the US."

The Packard (any year) "could have been the American Mercedes-Benz." Porsche makes the "best high-performance sports car today." The Studebaker (1953) had "ageless beauty" and was a "styling leader" (1946), even if it was the "right car for the wrong market." ■

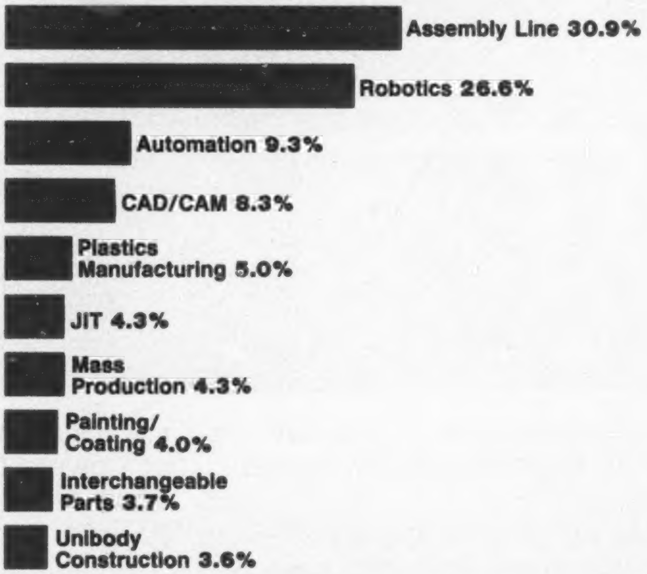
WHAT HAVE BEEN THE TEN MOST SIGNIFICANT TECHNICAL ADVANCES IN AUTOMOTIVE DESIGN AND/OR ENGINEERING OVER THE PAST 100 YEARS?



[1]—Including engine controls, electronic ignition, on-board computers and emission controls.

[2]—Including anti-block steering systems, seat belts and safety glass.

TOP TEN MANUFACTURING ADVANCES OVER THE PAST 100 YEARS



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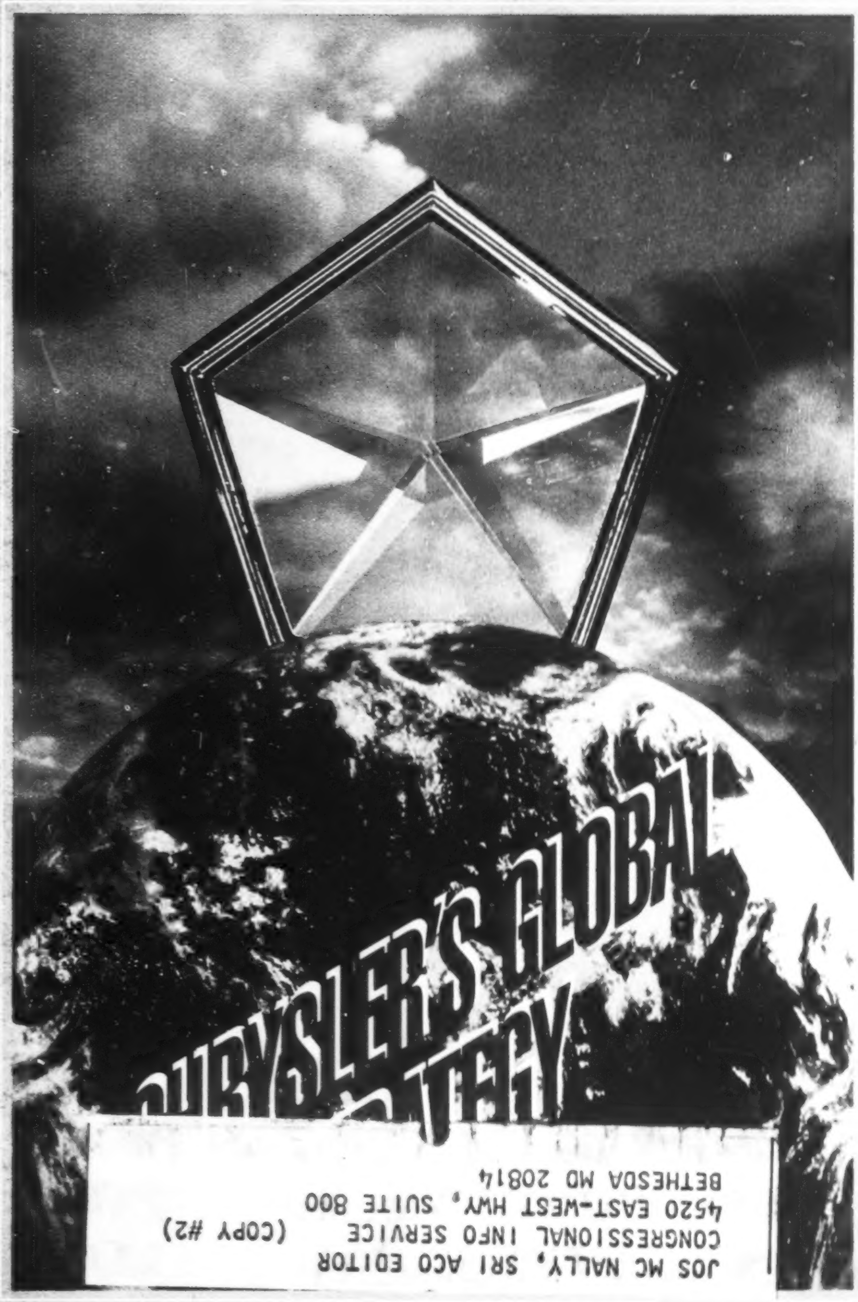

10th Annual SOURCE GUIDE TO SUPPLIERS

GM/Toyota's New Nova

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NEXT MONTH

July brings an exclusive *AI* tour of the purchasing departments of the nine companies building cars in the US.

QUOTABLE

"I understand Ford never saw an Audi 5000S before they came up with that, right?"—Peter Fischer, vice-president of Audi Div., VWoA, on Ford's new Taurus/Sable models.

"An airbag is another kind of feeling—it's like a pistol on me, and I don't like a pistol on me."—Dr. Ferdinand Piech, Audi R&D chief.

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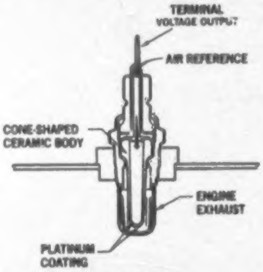

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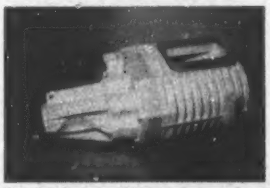

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INSIGHT/ANALYSIS: DETROIT

An Open Letter To Congress

by Joseph M. Callahan, Editor

A controversy of unusual intensity and significance is now raging in Congress, as it is in many areas of the country, as to the consequences of President Reagan's decision not to ask the Japanese to continue their Voluntary Restraint Agreement (VRA) on auto imports.

Despite comments in the media, there is no auto industry position on this question. General Motors emphatically favors the termination of these quotas, while Ford Motor Co., Chrysler Corp. and American Motors, as well as the United Auto Workers have predicted serious national ramifications will ensue from this decision by the President.

Now, Congress is grappling with this matter and it's quite clear that if any American or Japanese group is to take meaningful action on this critical issue, it will be the Congress.

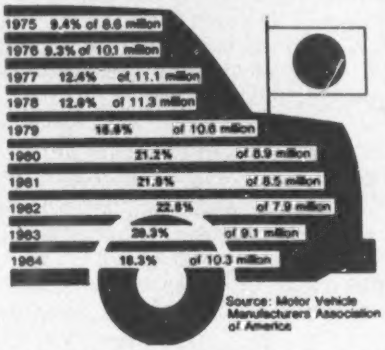
The critical nature of this issue is clearly indicated by the announcement from Japan that its nine automakers will increase their exports to the US in the first post-VRA year by 450,000 cars or about 25% above the 1.86 million authorized last year.

This added volume will increase the US's negative merchandise trade balance with Japan by another $5 billion, boosting the Japanese negative balance to at least $42 billion and the total negative balance to $128 billion, according to industry sources.

If the Japanese are willing to openly stake out this additional 5% of the US auto market during the present period of high congressional and public concern, just imagine how much they'll be striving for when the attention level is much lower in future years.

Many arguments have been used to support ending the VRA, but it's this reporter's opinion that the arguments have been quite defective.

Japanese Import Sales
In The United States



Source: Motor Vehicle Manufacturers Association of America

One argument is that this move by the President will preserve free trade and prevent a trade war. What absolute rot! The United States is the only major industrial country in the world that practices anything resembling free trade. Free trade cannot be a unilateral thing.

And as for the sanctimonious argument that a completely open American market is needed to prevent a trade war, the fact is that an international trade war has been going on for years and the US was defeated last year by the greatest margin in history—by $123 billion.

Furthermore, a large percentage of the products that are exported from the US are raw materials needed to produce the high labor-content finished goods that then find their way back to this market. In other cases, these US products are not readily available elsewhere.

A common argument for the VRA is that GM, Ford and Chrysler have just competed a couple of very profitable years. This is true to an extent, but the profits aren't really that great if one honestly looks at the losses of the three previous years, or at the expenditures required for future new models or at the ratio of profits to sales.

But even more important is the fact that these three large companies are not the entire American auto industry. In addition to the other domestically-based automakers, there are approximately 28,000 suppliers to the auto industry. Thousands of other large and small firms service these suppliers and their employees, so it's demonstrably clear that the real "auto industry" permeates our entire nationwide economy.

Listen to Joe's Auto Report every Monday through Friday over WJR Radio, Detroit.

Most of these suppliers will be hurt much more than the Big Three makers by a major decline in the American auto industry. They will lose business not just because of the rapidly increasing number of imported cars in this country, but also because all the American auto companies are going to be forced to buy an ever-increasing percentage of their parts from low-cost producers in Japan, Korea, Brazil, Taiwan and even China in the near future.

Finally, the argument is made that it was appropriate to discontinue the VRA because, after four years of semi-protection, the American companies can compete with the Japanese automakers, if only they'll try.

This is simply not so. This is untrue because of the 25% under-valuation of the yen which is an enormous advantage for the Japanese, because the Japanese Commodity Tax of 18.5% and 23% (on larger cars) acts as a tremendous subsidy for the Japanese, because the US provides most of the national defense for Japan, resulting in a 5% national defense cost disadvantage for all US products and because US labor costs are 35-40% higher than those in Japan.

Every country in the world protects its auto industry in one way or another. The American auto industry has practically no other protection and for that reason it should have the limited protection of the VRA. ■

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AI MARKETDATA

The Envelope, Please

According to the Japanese newspaper Asahi Shimbun, the 1985 VRA allotment has been decided for each Japanese automaker. Interestingly, 37% of the increase will go to GM's and Chrysler's captive import cars built by Isuzu, Suzuki and Mitsubishi. Presumably this will be used to defuse some of the furor associated with the US trade imbalance with Japan. After all, how can the American companies complain about more Japanese cars being sold here when they're selling them, too? One other point: the following list does not include station wagons and vans.

1985 Voluntary Restraint Agreement Allotments

Company	Increase	1985 Allotment	1984 Allotment
Toyota	12.5%	620,760	551,880
Nissan	12.5%	547,920	487,100
Honda	15.1%	428,590	372,400
Mazda	32.4%	229,720	173,500
Mitsubishi	52%	186,010 (Chrysler—140,490 (MMSA—45,520)	122,400 (Chrysler—87,600) (MMSA—34,800)
Subaru	54.6%	117,200	75,800
Isuzu	134.0%	117,100 (GM—91,100) (Isuzu—26,000)	50,000 (GM—30,000) (Isuzu—20,000)
Suzuki	209.0%	52,500	17,000

In Search Of... The $125 Ride

Chrysler's aging Omni-Horizon subcompact models continue to sell well and score high in *AI's* annual Total Car Coefficient (see this issue). Still, ChryCo chairman Lee Iacocca complains of a lack of profit on the cars because of 8.8% financing programs. But sales of the little Simca-based econocars have rocketed because of the finance incentives. "I never saw such results in all my years in Detroit," says a happy Lido. "Our days supply [of Omni-Horizons] was 130. It dropped to 30 in four weeks time. They were knocking our doors down for 8.8 financing which shows how sensitive people are to car loans. What you don't know is that 8.8 financing went on 60-months paper mostly.

"There's a big wave of people there who, if you show them how to get a car for 125 bucks a month, they'll knock your damn doors down."

GM Outpaces Ford In Europe

With figures for market shares just announced in the European passenger car sector, GM has managed to nose ahead of Ford with 12.3% as opposed to 12.2% of the total market over the first three months of the year. It is generally considered by industry observers in Europe that General Motors has deliberately followed a policy of buying market share in Europe over the past year or two. GM's car operations on the Continent have been losing money steadily but sales have increased. Backbone of the General's success has been the J-car (Cavalier/Ascona) which is now showing its age, while the Spanish-built Corsa/Nova small car is establishing itself well.

Charge Of The Light Brigade

Competition is becoming more and more warlike in the compact truck market, with price sensitivity a critical issue for dealers and buyers alike. It's no wonder—the market is expanding dramatically, with total sales of over 1.7 million units in 1984, surpassing (for the first time) the better than 1.4 million full-size pickups sold in '83. Now all domestic makers have or soon will have compact pick-ups; AMC has just unveiled its Cherokee-based Comanche pickup in both two- and four-wheel-drive versions, and Dodge will soon be showing its N-truck—which is to be sized between the minis and maxis. Duncan Brodie, general director of truck sales for GMC truck and coach operations, estimates 93% of all truck sales in 1985 will be in the light truck segment.

No Drydocking This Fleet

The Big American Car, which now commands only 10% of the US market, will lose more of its mystical grip on Joe Citizen by 1990, according to J.D. Power and Associates. Within four years the floatmobiles should be pulling in only 8% of US car sales. No matter—the Big Three aren't docking these boats, but instead will be counting on this segment's juicy profits now that VRA has expired, say the Power people.

AI'S TOTAL CAR COEFFICIENT

Chevy's one-two econobox punch from Japan—the Sprint and Spectrum—KO the rest of the field in our annual formula for finding the quick, roomy, frugal and inexpensive cars of the US market.

TCC	UNDER $8000
.48	Chevrolet Sprint; 1.0-L, 5-spd man.
.41	Chevrolet Spectrum; 1.5-L, 5-spd man.
.37	Plymouth Horizon; 2.2-L, 5-spd man.
.31	VW Golf; 1.8-L, 5-spd man.
.30	Chrysler Colt Turbo; 1.6-L turbo, 5-spd man.
.29	Dodge Omni GLH; 2.2-L, 5-spd man.
.29	Renault Encore LS; 1.7-L, 5-spd man.
.28	Toyota Tercel 3-dr; 1.5-L, 5-spd man.
.26	Honda Civic S; 1.5-L, 5-spd man.
.26	Subaru GL-10; 1.8-L, 5-spd man.
.25	Dodge Omni GLH Turbo; 2.2-L turbo, 5-spd man.
.31	Group Average

TCC	$8000 to $12,000
.28	VW GTI; 1.8-L; 5-spd man.
.24	Pontiac Sunbird S/E Turbo; 1.8-L turbo; 5-spd man.
.22	Toyota Corolla GTS; 1.6-L, 5-spd man.
.22	VW Jetta GL; 1.8-L, 5-spd man.
.21	Ford Mustang GT; 5.0-L V8, 5-spd man.
.21	Oldsmobile Calais; 3.0-L V6, 3-spd A/T
.20	Honda Prelude; 1.8-L, 5-spd man.
.19	Plymouth Reliant; 2.6-L, A/T.
.18	Mazda 626 TS; 2.0-L, 5-spd man.
.17	Chevrolet Caprice Classic; 4.3-L V6, 4-spd A/T
.17	Dodge Daytona Turbo Z; 2.2-L, 5-spd man.
.16	Chevrolet Caprice Classic; 5.0-L V8, 4-spd A/T
.16	Mercury Marquis; 3.8-L V6, 3-spd A/T
.16	Subaru Turbo RX; 1.8-L turbo, 5-spd man.
.16	VW Scirocco; 1.8-L, 5-spd man.
.15	Ford LTD LX; 5.0-L HO V8, 4-spd A/T w/OD
.14	Buick Somerset Regal; 3.0-L V6, 3-spd A/T
.12	Isuzu Impulse; 1.9-L, 5-spd man.
.18	Group Average

TCC	$12,000 to $18,000
.18	Merkur XR4Ti; 2.3-L turbo, 5-spd man.
.14	Audi 4000S; 1.8-L, 5-spd man.
.14	Chevrolet IROC Camaro; 5.0-L HO V8, 4-spd A/T
.14	Nissan Maxima SE; 3.0-L V6, 5-spd man.
.13	Mitsubishi Galant; 2.3-L, 4-spd A/T
.12	Pontiac 6000 STE; 2.8-L V6, 3-spd A/T
.11	Audi Coupe GT; 2.2-L 5-cyl., 5-spd man.
.10	Alfa Romeo GTV6; 2.5-L V6; 5-spd man.
.10	Oldsmobile 98; 3.8-L V6, 4-spd A/T
.09	BMW 318i; 1.8-L, 5-spd man.
.07	Audi 5000S; 2.2-L, 5-spd man.
.12	Group Average

TCC	$18,000 to $25,000
.11	Volvo 740 Turbo Wagon; 2.3-L, 4-spd man. w/OD
.10	Peugeot 505S Turbo; 2.2-L turbo, 5-spd man.
.10	Saab Turbo 16; 2.0-L turbo, 5-spd man.
.09	Volvo 760; 2.1-L turbo, 4-spd man. w/OD
.08	BMW 325e; 2.7-L, 5-spd man.
.08	Mercedes 190E; 2.3-L, 5-spd man.
.07	BMW 528e; 2.7-L, 5-spd man.
.07	Cadillac Fleetwood; 4.1-L V8, 4-spd A/T
.07	Porsche 944; 2.5-L, 5-spd man.
.07	Group Average

TCC	Over $25,000
.06	BMW 535i; 3.4-L, 5-spd man.
.05	BMW 735i; 3.4-L, 5-spd man.
.05	Chrysler Limousine; 2.6-L, 3-spd A/T
.04	Porsche 928S; 5.0-L V8, 5-spd man.
.03	Jaguar XJ6; 4.2-L, 3-spd A/T
.03	Mercedes-Benz 500SEL; 5.0-L V8, 4-spd A/T
.04	Group Average

by Lindsay Brooke

Like the *tsunami* tidal wave of the Western Pacific, the Chevrolet-badged Suzuki Sprint and Isuzu Spectrum have swept the top two places in *AI's* annual Total Car Coefficient (TCC) rating. Scoring .48 and .41 ratings respectively, the Chevy imports clearly outpaced the third-place (.37) Plymouth Horizon, last year's TCC champ and sibling to the '83 TCC-winning Dodge Omni.

The TCC is a mathematical formula which uses objective measurements—interior volume, fuel mileage, 0-60 mph time and price to form a composite of the "ideal" car. The formula is: (interior volume x mpg) ✓ (0-60 mph time x price) x 10 = TCC.

Interior volumes (which on station wagons include only the passenger area) and city mpg numbers are supplied by the EPA. The *Kelly Blue Book Fifth Edition* is our source of retail FOB or POE prices; only options which affect performance (engine, transmission, etc.) were figured into the base retail price.

Zero to 60 mph times were generated by *AI* staffers, who managed to hold on to their drivers licenses throughout the testing. PBS' *MotorWeek* once again gave valuable 0-60 assistance and a few hard-to-get figures were culled from various enthusiast publications.

The fiesty little Sprint, with its 1.0-L three-cylinder engine and five-speed manual gearbox, achieved its record .48 TCC number for two basic reasons. It's priced at $5151—over $1000 less than the Spectrum, nearly $1000 less than the Horizon and a whopping $2100 under the fourth-place gas-engined VW Golf.

And then there's mileage. On this count, Sprint betters many motorcycles with its 47 mpg city rating. Spectrum gets closest of the test cars with 38 mpg, but the Golf (27 mpg) and Horizon (26) figures aren't even in the Sprint's league.

On the flip side the Horizon and Golf, and to a lesser degree Spectrum, positively embarrass the Sprint in 0-60 times (9.7, 10.6 and 12.4 sec. respectively versus Sprint's 14.0 sec.) and interior volume (85, 87 and 85 ft^3 vs. Sprint's 74 ft^3). But the little "Chevuki" has adequate space and zip to more than hold its own here.

Obviously price plays the spoiler in TCC. Note the TCC number overlap between price categories. If it weren't for pricing, cars like the GTI, Volvo 740 Turbo Wagon and especially Merkur XR4Ti would place strongly among much less expensive cars. ■

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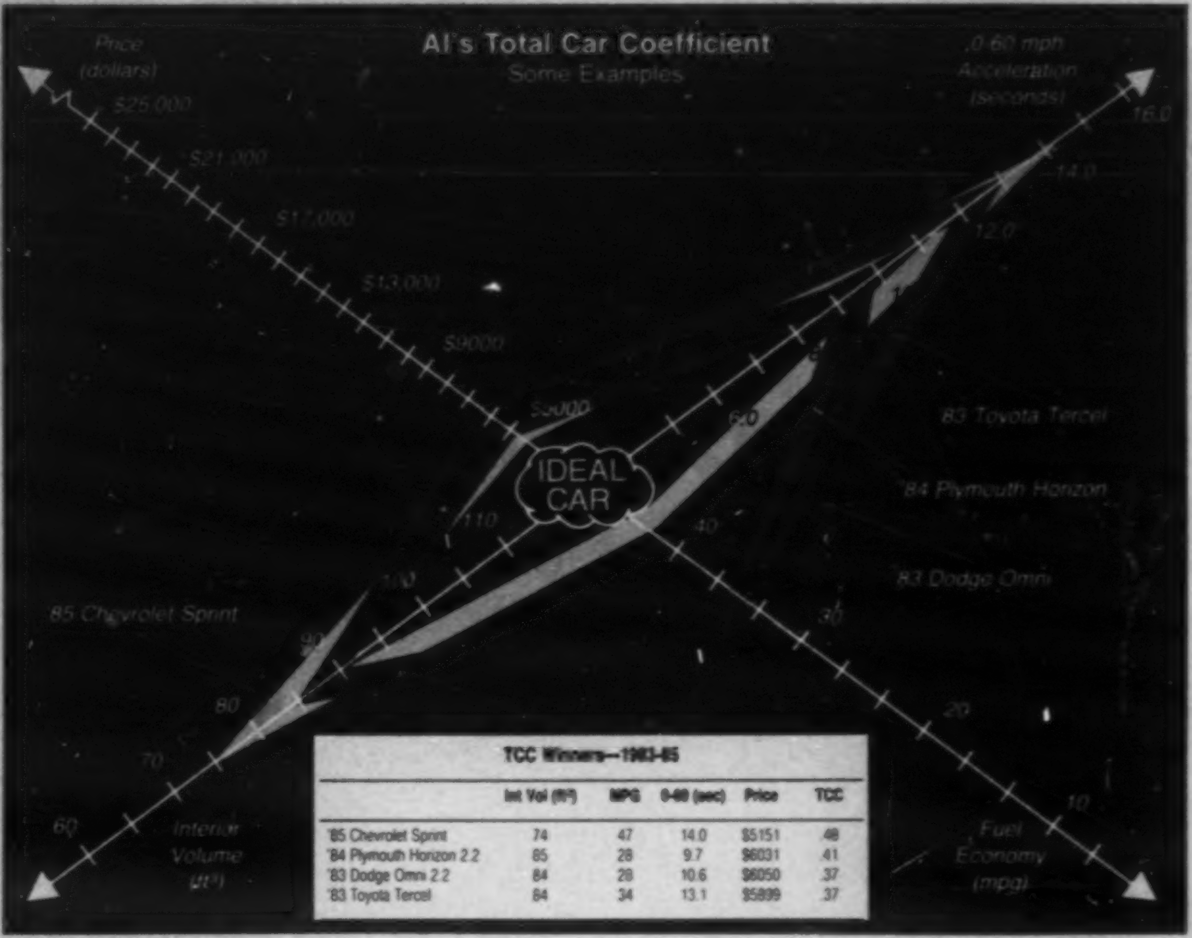

TCC Winners—1983-85

	Int Vol (ft^3)	MPG	0-60 (sec)	Price	TCC
'85 Chevrolet Sprint	74	47	14.0	$5151	.48
'84 Plymouth Horizon 2.2	85	28	9.7	$6031	.41
'83 Dodge Omni 2.2	84	28	10.6	$6050	.37
'83 Toyota Tercel	84	34	13.1	$5899	.37

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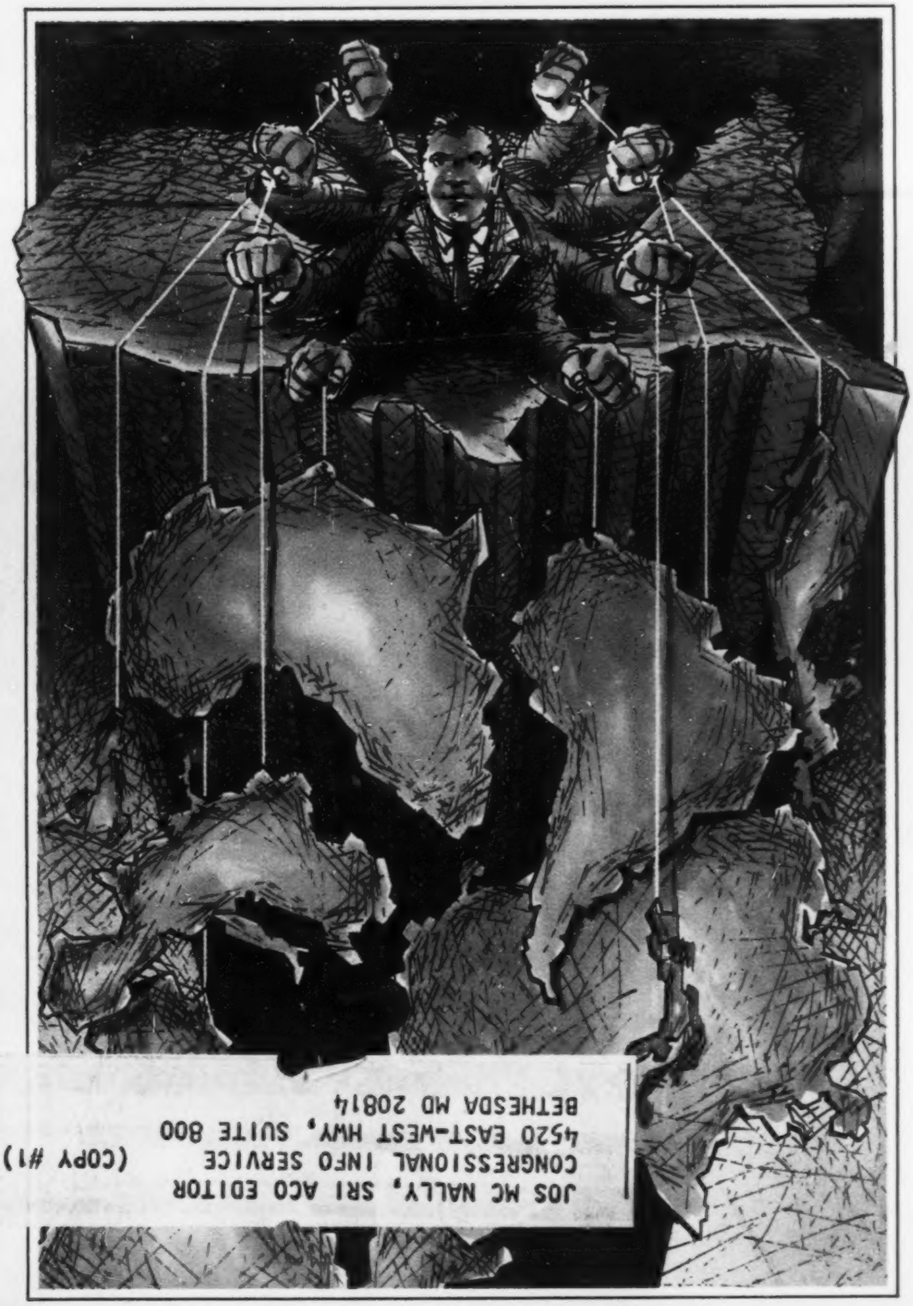

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AUTOMAKER PURCHASING

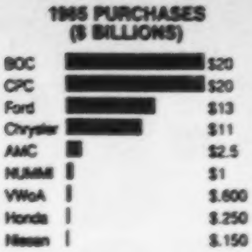
A Guided Tour Of Where They're Buying, How, And Why

Audi's 5000S Turbo Quattro: Another Giant Leap For Mankind

Point/Counterpoint On Japanese Voluntary Restraints

AUTOMOTIVE INDUSTRIES

July, 1985/Volume 165, Number 7



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A major OEM supplier in the UK is using a new software package for instant access to sales and inventory information.

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Needed to strengthen an ailing US auto industry is a healing dose of trade restraints to keep the players in the same class.

41 ...OR A LIBERAL DRAFT OF COMPETITION

Protection is hard to resist and even harder to give up once tasted, but a swig of competitive spirits could light a fire under automakers' backsides.

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Mirror Marketing: When your badge is all that makes the sale. Customer Satisfaction: Little things mean quite a bit, saleswise.

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QUOTABLE

"You better get your own house in order... The union has to give up these silly work rules. Read my book. Nobody listens in Washington. We have a plan; our '89s are almost finished. You need a game plan. The only guy without a plan is the US government at the federal level. We—government, labor, management—are all adversaries. *That's* civil war, guerrilla warfare. Who the hell needs that?"—Lee Iacocca, chairman of Chrysler Corp.

"My goal is to get all the doctors out of their Rolls and Mercedes and back into Cadillacs."—Richard O'Brien, GM director of employee benefits, on cutting health costs.

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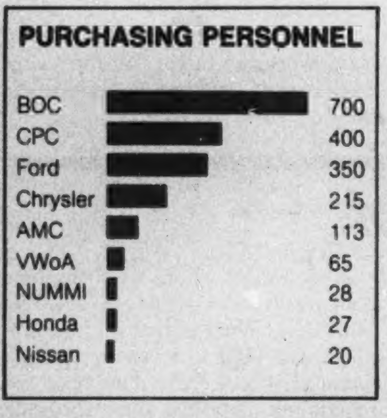
A GUIDED TOUR OF AUTOMAKER PURCHASING DEPARTMENTS

Straight talk from the big nine automakers—why they're sourcing where and from whom. And why breaking in is hard to do.

by Joseph M. Callahan

What follows is basically a guided tour of the purchasing departments of the nine auto companies building cars in the United States today. The companies are divided into US-based operations: GM's Chevrolet-Pontiac-Canada (CPC) group and Buick-Oldsmobile-Cadillac (BOC) group; Ford Motor Co.; Chrysler Corp. and American Motors—and foreign-owned or managed: Honda; Nissan; NUMMI and Volkswagen.

Since selling widgets and wodgets to automakers these days takes a little more than a suit full of cigars or a lavish entertainment budget, *AI* went to the top purchasing honchos in the industry to probe the new trends they see emerging in the complex relationship between an automaker and its suppliers.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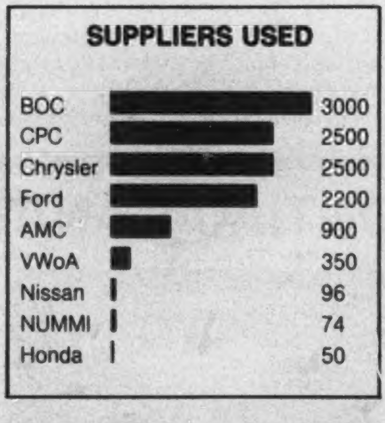
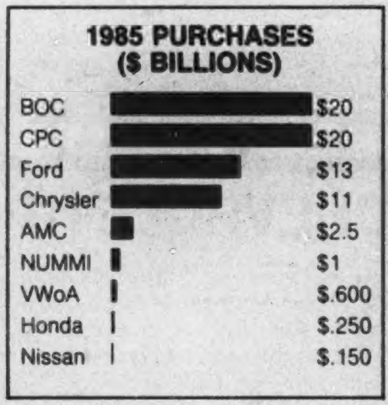
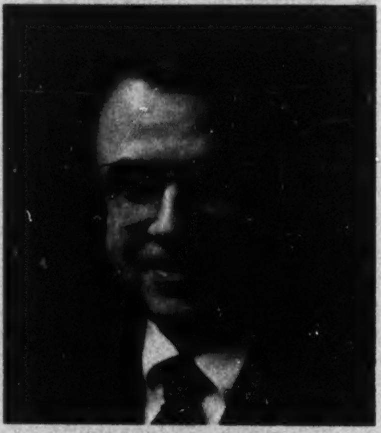

SUPPLIERS USED


1985 PURCHASES ($ BILLIONS)

BUICK-OLDSMOBILE-CADILLAC

(Buick-Oldsmobile-Cadillac's Material Management Staff now has six people who manage the purchase and delivery of about $20 billion worth of commodities that are purchased each year from some 3000 suppliers. Some 700 other staffers also buy components and manage material in the four platform teams.)

Although a primary goal of GM's reorganization last year was to become more efficient with fewer people, BOC has discovered that to achieve some other goals, including fixing responsibility, it has become necessary to set up four material management groups—one for each platform.


Darrah Porter, director of materials management at BOC.

Only three procurement staffs were required previously. There's also a separate body procurement group. Paint is now purchased at the group level, although other commodities may be added later.

Asked if this didn't produce duplication, Darrah Porter, director of materials management at BOC, said, "If you focus on function, it might appear so. But if you broaden your focus to concentrate on the product, when things go right, or wrong, you can see who has the responsibility."

Porter said his people are looking at off-shore sourcing opportunities, but nothing is ready for announcement at present.

GM is somewhat restricted in this

(Continued)

> *"We don't have the resources to deal with the number of suppliers we're dealing with today."*

regard because of agreements it worked out with the UAW in the last contract.

Porter said there are three major changes now occurring at BOC. One trend is toward "front loading," in which suppliers are invited to participate in early product development to improve the quality and to make other benefits possible.

The second goal is to make continuous improvement in quality and productivity even after the part is being produced properly. The third goal involves a "participatory environment" in which a team effort is encouraged to implement the continuous improvement.

On the question of reducing suppliers, he said, "We don't have the resources to deal with the number of suppliers that we're dealing with today. So, as we go on, accomplishing our objectives, there will be a shake-up.

"The kind of supplier that will be retained is the supplier who has the capability to do it right the first time and ship it right 100% of the time at a competitive cost.

"I didn't say a competitive 'price' even though we'll still be using prices. Our commitment is to work with our suppliers on a mutual cost so that the price generates out of that relationship."

In the future, he said BOC anticipates partnerships with its suppliers in which his people will lay a part in front of a supplier with a cost target on it and ask the supplier if he wants to meet that challenge over the life of the product, possibly six or eight years. The plan might call for a certain percent performance improvement over the years.

Other Comments:

- Computer-to-computer links with suppliers are already a fact in many cases, although it will take up to seven years to complete the network. Buick City may be an industry leader in this activity.
- SPC will be needed by suppliers to achieve the improvements BOC wants.
- AIAG is essential to the continued improvement in the supply base. It is one of the approaches that will help the US become competitive worldwide.
- BOC will set up a supplier council and adopt other measures to improve communications with suppliers.

CHEVROLET-PONTIAC-CANADA

(The Chevrolet-Pontiac-Canada (CPC) Group at General Motors has a staff of 400 people in its Purchasing Department who spend about $20 billion a year with 2500 suppliers.)

Since last fall the Material Management Department of GM's CPC Group has done a good deal of soul-searching to find out how it can better serve the Group's retail customers by improving its relations with suppliers.

Donald Pais, director of material management, said this effort first consisted of an exploratory meeting with 40 major suppliers. Then, a "blind survey" (no identities) was made to see how a much larger group of suppliers viewed their relationship with GM. Later, several multi-disciplinary teams were formed with both GM and supplier people participating to further explore several areas.

Last April CPC held a major conference with its suppliers to explain the start of the CPC's new approach to purchasing. Pais emphasized that this was only a first step and it will take some years before the whole new system evolves. He said the new purchasing practices involved these six steps:

Donald Pais, director of material management at CPC.

1. Improved financial relationships. The suppliers said they wanted some new approaches to how they were paid, possibly going to electronic transfer of funds. An important change coming involves "progress payments," whereby the supplier gets paid for some costs before a project is completed.

2. Communications with suppliers is an area that needs lots of work, Pais said. He anticipates that in time suppliers will be able to tie in through computers to CPC's data base for scheduling, shortage and expediting information. This system should be set up for all suppliers in the near future. Pais added, "We're working closely with the AIAG on that.

"Also there's a heck of a lot of other information flowing between us and our vendors—drawings, engineering information and so forth. None of that information should be in hard copy."

He said that communications between the president of the supplier firm and GM's management needs to be improved, especially if the supplier is contemplating a major business decision.

3. Schedule stability and some processes that CPC has in place to really help that problem. In addition, one team is working to better define the role of the buyer—where it starts and ends. Some suppliers complained that buyers were even hard to reach.

"One problem is that a number of suppliers don't understand that we're restructuring."

4. Quality and some of CPC's new programs for improving it. Quality has now been incorporated into CPC's purchasing operation.

5. Single sourcing. This is a strong CPC trend and 97% of the chassis parts for Chevrolet and Pontiac are single-sourced.

He said that single sourcing has nothing to do with the number of suppliers. In the past many GM suppliers have made 50% of mythical Part A and 50% of Part B. Now, one supplier will make 100% of Part A and another will do 100% of Part B.

6. Early supplier involvement. This, according to Pais, is a process in which the buyer and the supplier become involved early in the design stage of the part and possibly before the design stage. A good example of this was the Pontiac Fiero. The sources of the plastic skins were selected before the design was completed.

"You're always plagued with last-minute engineering changes," he said. "Our analysis shows that a big percentage of those changes were requested by the supplier to suit his manufacturing processes. The engineer usually says, 'Fine,' but why wait until the part is released?"

In conclusion, Pais said, "One problem is that a number of suppliers don't understand that we're restructuring. We also want to talk long-term contracts with suppliers.

"If you stop to think about it, contracts have many nuances. You've got to have that intangible of trust, knowing one another and understanding the commonality of objectives, the interdependence and the willingness to be participative. Suppliers tell us we've lost some of that over the years, but we're going to work on it."

FORD MOTOR COMPANY

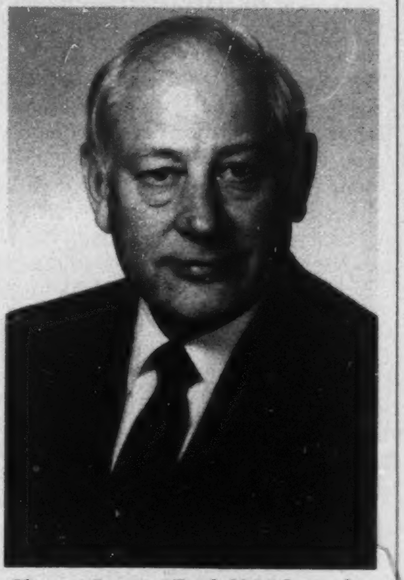
(Ford Motor Co. spends $13 billion a year on production parts, with a staff of 350 people who buy from about 2200 suppliers.)

"I've told our suppliers that of the $2500 [Japanese cost advantage], somewhere between $500 and $700 of it is outside materials cost," said Clinton D. Lauer, Ford's executive director of production purchasing at the North American Automotive Operations. "We've got to find ways in the next three-to-five years to bring that down to nothing. If we're going to remain a viable competitor in this industry, we have to be able to produce products at competitive cost levels.

"In fact, we want our suppliers to shoot for at least as much productivity, if not more, than the Japanese are getting.

"I could buy all the parts from Japan and be at the same cost level as the Japanese," Lauer continued. "But, in fact, I want to buy from other parts of the world because I think some of them offer advantages over the Japanese.

"Clearly there's a need for a US supply base because I think that in most commodities your most efficient supply base five years from now will be right here. I'm relatively optimistic."



Clinton Lauer, Ford NAAO production purchasing executive director.

Lauer said Ford's primary goal is quality and that if quality can be improved, Ford's secondary goal—lower costs—will also be achieved.

Ford Motor Co. has a system for rating suppliers and Lauer has asked his buyers to start weeding out the least capable suppliers.

Of the 100 points possible to get in this rating system, 20 points are awarded if the supplier uses Statistical Process Control.

Other Comments:

- Ford has tended to buy more of its vehicle outside, rather than inside during the past three years.
- Ford is consolidating its purchases, allowing suppliers to more efficiently run more material down the same production lines.
- Ford and some suppliers are trying to sort out how CAD (Computer-Aided Design) and CAM (Computer-Aided Manufacturing) can be adapted to their operations.

Lauer has also notified Ford's component suppliers that they're going to have to become more deeply involved in the design of their components because Ford isn't going to be able to afford all the design people it has historically had.

"And we're not so sure we can design things as well as the suppliers," he continued. "We've told our suppliers we'd like them to work closer with our engineers. Secondly, we've told a number of them that we want them to take specific design responsibility.

"We're thinking in terms of black boxes or grey boxes or whatever. We've been increasing those kinds of

(Continued)

things at a significant rate. We're trying to make sure that the product design is compatible with the process of the supplier, so that what comes out finally is the lowest-cost product that meets the function. In time 80-90% of the components will be engineered by suppliers, with the company doing most of the vehicle engineering."

Touching again on productivity gains, Lauer said his people typically are asking for 8% increases annually. Reminded that this would amount to a 40% increase over five years, he said that's not totally unreasonable and that many suppliers agree with him.

Lauer asserted, "The old standard of 2% or 2½% productivity [increase] a year is a thing of the past."

> *"I want to buy from other parts of the world."*

CHRYSLER CORPORATION

(Chrysler Corp.'s Production Purchasing Department has a staff of 215 people who spend around $11 billion a year now with some 2500 suppliers.)

"[The end of the VRA] is one of the biggest changes we've ever had," said Thomas T. Stallkamp, director of production purchasing at Chrysler.

"And because the car companies are changing drastically, purchasing has to change, too. So we're investigating several new ways of doing business.

"The first one we're doing is called Value Managed Relationship (VMR). This is an attempt to work closer with suppliers so that they have a longer time frame to deal with us and more assurance of business. Now we're trying to integrate purchasing into design and into the forward model engineering activities much more closely.

"We have design contests for forward models. We're doing it now for the Liberty Program and for selected things on the 1988 cars. Our integration is to identify the source earlier. Hopefully, we can reduce our engineering manpower. We can handle more projects with the same number of engineers, and we design the part to fit more closely a supplier's process. We're trying to get closer to the supply base. This is the way it was in the US 50 years ago."

Asked about a report that Chrysler wants to reduce the cost of the parts it purchases by $1100 a car, he said he prefers to use 30% rather than the dollar figure as the goal for cost reductions.

"The 30% is the target we've established and told the suppliers about," Stallkamp said. "It's a tough culture shock when you go to a guy and say you'd like him to reduce his prices by 30%. But we try to work with him.

Thomas T. Stallkamp, director of production purchasing at Chrysler.

"It's not just a pure raw cost of each piece, but in the total cost that went into developing the part. Now by working with the supplier from the start on the prototype we hopefully can achieve the 30% reduction. It's tough for the supplier but we do it in phases."

He said that offshore suppliers and even some aggressive US suppliers are responding affirmatively to this challenge. Asked if US suppliers can really meet this demand, he said they surely can, adding that there are labor rates now in the US as low as Japan's.

"We have suppliers in the southern US with $6 an hour labor costs and fully-loaded [with fringe benefits] it's less than $10, and $10 is what they quote in Japan for Mitsubishi's suppliers," he said. "We even have suppliers in Michigan who pay $10 an hour, including fringes.

"All this publicity of going offshore is in my mind not as negative as it appears. What we're trying to do is to show US suppliers just what their competition is. Our hope is that they will respond to the offshore competition, working with us over a longer time frame and producing more imaginative contracts."

To communicate its position clearly to suppliers, Chrysler now issues a monthly newsletter, conducts frequent supplier meetings and holds seminars for its suppliers. Chrysler reportedly now buys about 10% of its commodities offshore. Stallkamp says whether this goes to 15% or more depends on the response of suppliers.

"Some labor rates would be impossible for US suppliers to respond to, especially in Korea and Taiwan," he said. "So the very labor-intensive products will probably go offshore. But some technology-oriented things like semi-conductors will probably come back here. This country still has a lot of potential."

> *"We're trying to get closer to the supply base."*

Other Comments:

- Just-in-time is one way for suppliers to partly achieve the 30% target.
- Chrysler is very interested in returnable containers and getting rid of cardboard boxes.
- The AIAG is hopefully a mechanism to get the US OEMs together so it can compete better with the import companies.
- Chrysler recently surveyed its suppliers to get their feelings about computer-to-computer communications and will soon announce its electronic program for suppliers.
- Electronic transfer of funds to suppliers has already been started by Chrysler in Canada because of the slowness of Canada's postal service and their central banks.

AMERICAN MOTORS

(AMC's Procurement Department has a staff of 113 people who spend a total of about $2.5 billion annually with some 900 suppliers.)

Despite its current sales and cash-flow problems, American Motors has an active Procurement Department that's being improved under director of purchasing John Bechtel, a one-time Ford purchasing executive.

"A number of things are changing at American Motors," Bechtel said. "We are now trying to get up-front on new programs, to get new major components identified earlier, and to get vendor output in the design and development feasibility back at the definition stage.

"So we're doing a lot of pre-sourcing, pre-awarding and then working directly with the vendor on engineering from the concept right down to the final product."

Noting that this approach almost automatically leads to longer-term contracts, Bechtel said, "It's usually some kind of an understanding about productivity and longevity and how we will handle the economic adjustments, the quality standards and most of the little 'ticks'."

AMC director of purchasing John Bechtel.

Asked about off-shore sourcing, he said that Renault has design responsibility for AMC's cars, which therefore get quite a few components from Renault. And even excluding the parts from France, he said that AMC's off-shore sourcing is still relatively high, compared to the rest of the industry. About 35% of its parts are imported, including a goodly percent from Japan. Mexico is also a significant source for Renault-built engines and Brazil is a minor source.

> *"We're certainly looking at other foreign sources."*

Regarding the future, Bechtel said, "We're certainly looking at other foreign sources. The next step is probably Korea."

Sourced component modules that AMC has slated for use in its cars include completed instrument panels, complete built-up seats, windows equipped with weather-stripping and even pre-assembled wheels and tires. For it's Canadian-built front-wheel-drive 1988 car, the company will purchase most of the body panels from a supplier.

Bechtel said his company is increasingly working with its suppliers on computer-to-computer communications, bar-coding, standardized packaging and other standardized items being implemented by the AIAG.

NUMMI

(New United Motors Manufacturing Inc. (NUMMI), Fremont, CA has a staff of 28 people in purchasing who will spend over $1 billion this year with some 74 US suppliers and about 100 Japanese suppliers.)

Following Toyota's practices, NUMMI begins to qualify a supplier 18 to 20 months before production start-up.

"Early in the qualifying process our people will be spending time at suppliers, with team after team visiting the supplier to learn as much as they can about the firm, enhancing the strengths and seeking solutions to his weaknesses," said Alan G. Perriton, the former director of materials management on GM's corporate staff who is NUMMI's advisor on material management.

"The reaction from the supplier community is that they basically like this kind of early interface, saying, 'We think we can make a contribution, and you're telling us it's our responsibility to make that contribution.' "

Alan G. Perriton, NUMMI's advisor on material management.

Perriton elaborated, "Buyers here are assigned by supplier, not by part numbers. Buyers deal with suppliers on the basis of long-term relationships—not twelve-month relationships.

"Once you are a qualified and established supplier, unless you do something drastically wrong, you are on the team. Even then we will spend the time necessary to bring you back in line. You have the business as long as you perform as a good supplier.

"We might also see some differentiation in the supplier approach in the establishment of prices. They are often cost-targeted as opposed to strictly low-bid based. A great deal of negotiation occurs between the buyer and the supplier."

A Toyota operating principal called "Heijunka" is incorporated into the NUMMI system. This is a production-leveling philosophy that says your business runs more efficiently and cost-effectively if you do

(Continued)

not have to fluctuate production schedules by a large amount.

If this is done, Perriton said, "It's going to allow you to reduce your inventory levels, allow you to manage your work force more effectively and allow you to run your machinery and equipment to optimize your maintenance. All this permits projecting production schedules much further in advance than normal.

"Another significant thing showing up here is that quality is absolutely required. Specifications, quality standards, inspection standards and so forth are predetermined for everything that occurs in the manufacturing process. If the supplier ships us a bad batch, we send it back to him 100% and close the plant for two days. And that's unfortunate.

> *"Once you're a qualified supplier, unless you do something drastically wrong, you're on the team."*

He said each NUMMI buyer works with one to ten suppliers, depending on the amount of work involved. He's not a "brake system buyer," but a buyer for supplier A, B or C. The motivation is greater familiarity with the supplier.

Perriton said about 50% of the car's content, including assembly labor, is American. Steel is about 50% US-sourced, with LTV Corp. supplying the US portion and the electrolytically-galvanized steel coming from Japan.

He concluded that NUMMI expects its current supply situation to remain very stable, although it will consider buying electrostatically-galvanized steel here when it comes onstream.

VOLKSWAGEN OF AMERICA

(The Production and International Purchasing Department of Volkswagen of America has a staff of 65 people who spend about $600 million each year on purchases from about 350 US suppliers for both production and non-production items.)

F. Robert Joseph, VWoA's director of production and purchasing.

Volkswagen of America has in the past year or so increased purchases from W. Germany by about 25%, according to F. Robert Joseph, VWoA's director of production and international purchasing.

Joseph indicated the strong dollar is one reason for the increase.

"Secondly, with our volume being relatively small at present, just the cost of tooling-up gets into the calculations. If the part is tooled overseas, frequently the bottom line number suggests that we can buy it more economically overseas."

Joseph and his staff have three main functions—buying production parts for the Golf that's produced in New Stanton, PA; handling the importation of production parts from Germany and elsewhere; and purchasing and exporting about $100 million in parts from US suppliers to VW plants in Germany and elsewhere. From the cost standpoint, more than 50% of the US-built Golf is sourced here, he said.

In the past the VW headquarters purchasing group has handled the buying of parts for VWoA in Japan and the Orient. However, in the past six to nine months Joseph's people have been making some initial contacts for themselves in the Far East and this buying will become more aggressive.

Another important area of growth in VW sourcing will be in northern Mexico because the government has made it extremely attractive for US automakers to purchase wiring harnesses and other components. These commodities are strictly for export, mostly to the US.

Regarding the demands VW makes on its suppliers, Joseph said, "Obviously, after quality, price becomes very important. Also important is their willingness to meet whatever special requirements we have. And there's myriad other factors—supply history, logistics and so forth.

He said VWoA has not gone out to its suppliers with letters asking for price reductions because, "We have always felt that we were effectively trying to hold the line on price increases to begin with.

> *"Obviously, after quality, price is very important."*

Other Comments:

- VWoA is slowly shifting to longer contracts with suppliers and using more supplier engineering, as the custom has been in Germany.
- Just-in-time delivery is not a factor because of the distances involved. However, in time Joseph expects all VWoA suppliers will employ Statistical Process Control.
- The AIAG is important to VWoA, and VW of Germany is pressing for the development of a similar organization in Europe.
- Electronic communications with suppliers is now starting at VWoA and in time it's expected to spread to all vendors.

HONDA OF AMERICA MFG.

(Honda of America Mfg., Marysville, OH has a Purchasing Department of 27 people who spend about $250 million a year with 27 US suppliers. The company build Accords at present and is preparing to build Civics at the plant in the near future.)

Darrell Shown, Honda of America Mfg.'s purchasing manager since 1981, said his company now uses about 50% local content for its cars. These are the heavier, bulky items such as tires, batteries, carpets, seats, glass, air conditioning and trim parts. Over 90% of the steel is purchased from one US firm.

However, he said his company is now working on a program to raise its US content to 60% by purchasing other products such as electronic devices and controls that now come from Japan.

But Shown said these probably will be sourced at Honda's "captive" suppliers after they're established here. He said all the other Japanese vehicle makers in the US have similar plans.

"We will not substitute quality for anything. If the part can't be produced in the US with a high quality compared to Japan, then we will not source it here. Along with that, it must be competitive and delivered on time. We are definitely involved in just-in-time."

He views Statistical Process Control as an increasingly popular approach and one that is positive, but Honda doesn't pressure its suppliers to adopt it.

"But," he continued, "we have our own program we want them to follow. Zero Defects is the ultimate goal. We assist our suppliers in achieving that goal. A majority of our suppliers do supply zero-defect parts to us, although we have to assist those that are not up to that level.

Darrell Shown, Honda of America Mfg. purchasing manager.

"We have implemented a QAV [Quality Assurance Visits] program which is dedicated to improving the quality of the parts supplied to Honda. We believe in total involvement with our suppliers. We look at them as an extension of our plant. Quite honestly, we make them perform.

'If there's a problem with any component or part being manufactured on the outside, we immediately dispatch people from purchasing, quality control or the die maintenance area to eliminate that problem."

Shown said his people communicate directly with every supplier on a daily basis and often many times during the day, regarding their performance, their production and what's happening within their facility.

"We want to know if they're having any problems," he continued, "or if they're anticipating any problems. We're checking to see if they have enough raw material and adequate parts from their suppliers. We check when they're scheduled to put in a mold or die to make our parts. We just try to head off any problem before it develops."

> *"We believe in total involvement with our suppliers. Quite honestly, we make them perform."*

Honda doesn't have programs for improving productivity at supplier plants because, "We do our homework related to pricing in the beginning."

Commenting on US purchasing, Shown said, "We want to deal with domestic suppliers as much as possible. But the US industry doesn't dictate to us to buy a particular item.

"We're building automobiles [Accords] in Marysville that are sold east of the Mississippi River. The ones we import are sold west of the Mississippi. These two automobiles must be identical. I can't procure an item that's different than the one made in Japan. Many people are not willing to make our designs our way."

He said that one of the biggest problems for Honda is that US suppliers are not competitive in price with the Japanese. The reason for this, he said, is evident when you visit their US plants and observe their "non-competitive ways."

After noting that Honda has a policy of getting a firm commitment from the president of each of its suppliers, he said, "If the president commits to and understands our policy, then there should be no way at all that we should fail because it will be delegated all the way down through the system. It has to start with the president, not with anyone else."

NISSAN

(Nissan Motor Mfg. Corp. USA, Smyrna, TN has a staff of 20 people in its Purchasing Department. They spend about $150 million a year with 96 suppliers.)

Nissan has local content of 45-50% in its cars and 50-55% in its trucks, but it's not satisfied with these percentages and is seeking 100% local content, said Robert Frinier, Nissan's vice president of purchasing and information systems.

Frinier said, "We're continually studying new sourcing alternatives to buy additional commodities in the US. We have a Local Sourcing Task Force that identifies possible sourcing at US suppliers.

"These people visit the suppliers, evaluate them regarding our three principal criteria and then come back to form a group consensus to determine if the supplier meets those crite-

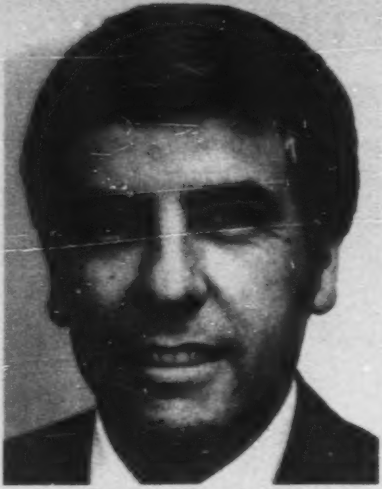
(Continued)

ria and then proceeds to get approval."

The three criteria for a US supplier are simply that he must have quality, cost and dependability that is equal or better than that provided by Nissan's suppliers in Japan.

"Our goal is 100% US sourcing," Frinier said. "But I don't realistically think in the near term we have a shot at that, given our production volume. Our parent company president has told us we should shoot for 100% but things like engines and powertrains could not be manufactured cost-effectively here in (Smyrna) Tennessee until we get 300,000 to 500,000 units of volume."

He anticipates that more Japanese suppliers will be coming to this country and that Nissan undoubtedly will be doing business with them. He said they don't have any in-born advantage and must compete with other suppliers with American management.



Robert Frinier, Nissan's VP of purchasing and information systems.

Asked about the performance of American suppliers, Frinier said, "I'd say generally very good. They're able to make the parts properly. All of our suppliers meet the criteria of quality and prices.

"But there have been some cases in the beginning where the supplier had to learn that when we set a quality standard that we meant it. We won't accept any compromise. We have a very open relationship with our suppliers, visiting them frequently. They're here frequently and we exchange a lot of key ideas."

> *"Our goal is 100% US sourcing."*

Frinier said Nissan doesn't directly set future productivity requirements. Instead, it has life-of-part pricing which means that price won't change until the design changes. Only when the raw material price changes is any price change considered.

He added that Nissan is just getting into just-in-time sourcing, but it is firmly committed to single sourcing.

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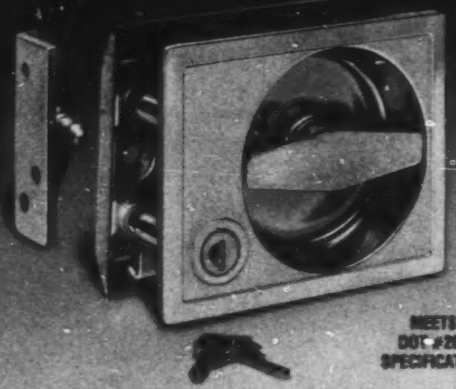

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Customer Satisfaction: Oh, Those Golden Goodies!

Holy Horsepower! Japanese Hydrogen Car Revealed

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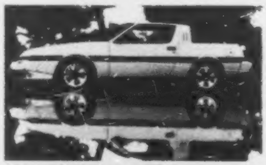
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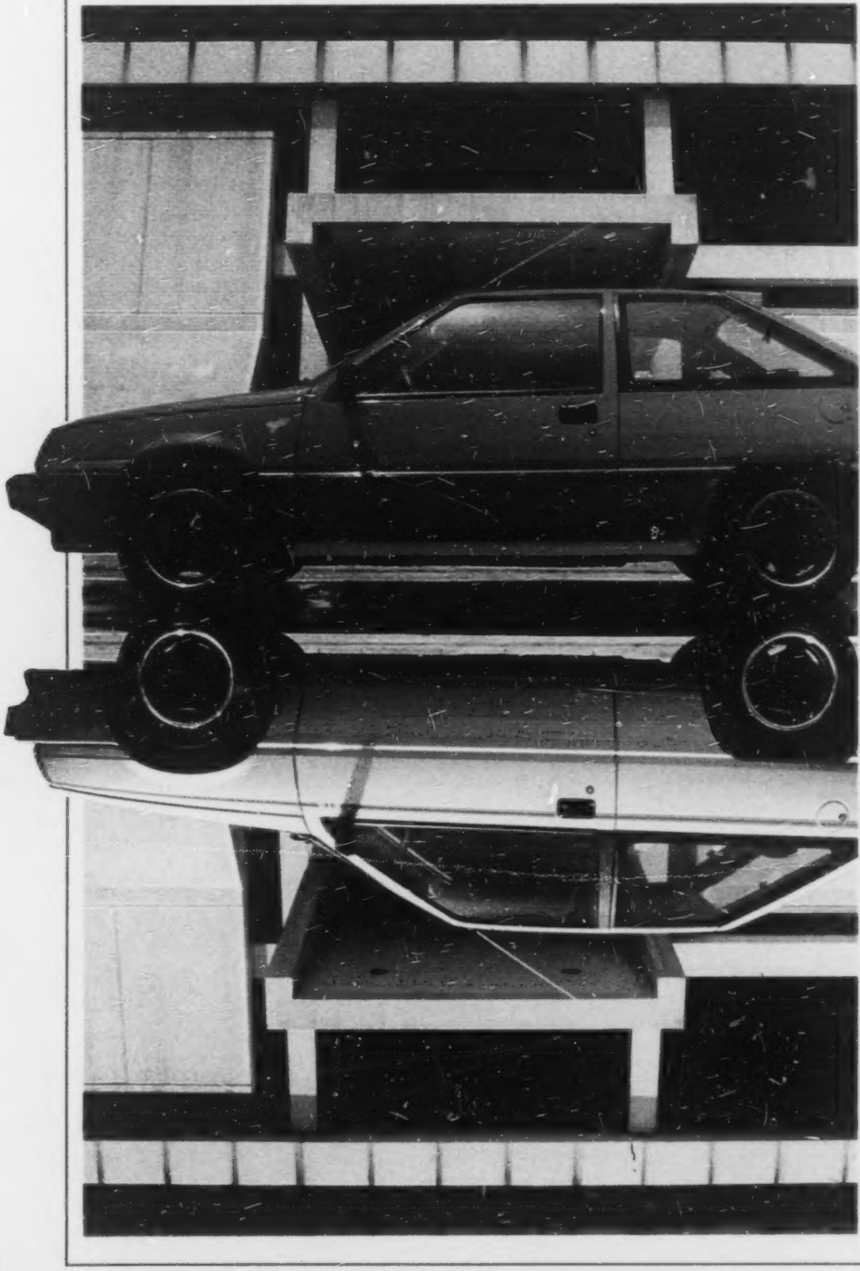
MIRROR MARKETING: WHEN YOUR NAME IS YOUR UNIQUE FEATURE

Badge engineering phase II, or, "No-one ever went broke underestimating the intelligence of the American people."



by Lance Ealey and Lindsay Brooke

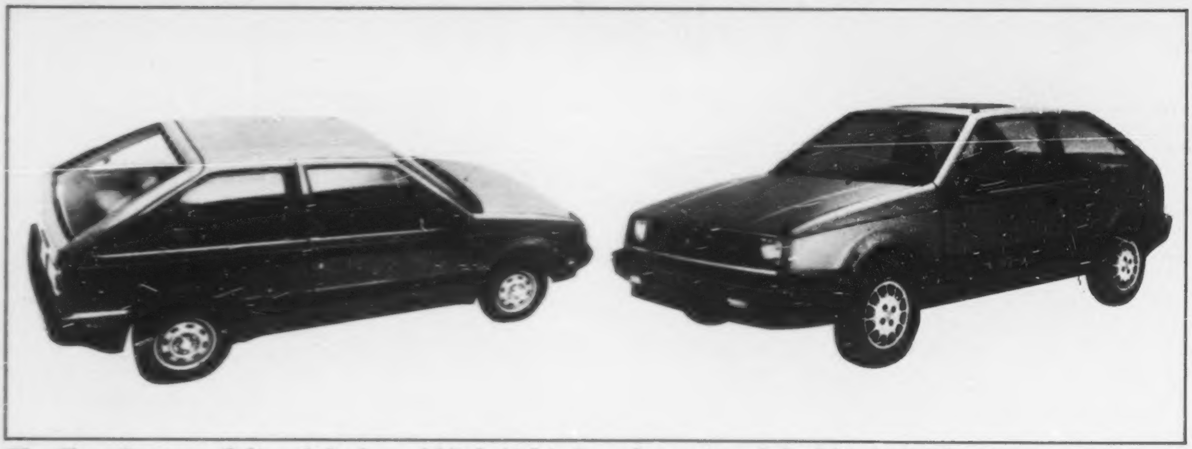
"We even had one customer the other day that we tried to sell a [Chevrolet] Spectrum to. He said he wouldn't buy a Spectrum, but he would consider an [Isuzu] I-Mark. We didn't have what he wanted so I said, 'let me show you the Spectrum, it's the same car.' He said, 'hey, I wouldn't buy anything that says Chevrolet on it.' I said, 'But it's made by Isuzu.' He said 'I don't care, it says Chevrolet on it.' "—Larry Martin, sales manager of Jim Quinlan Chevrolet/Isuzu, Clearwater FL.

The art of attaching one's badge to someone else's sheetmetal has taken a curious twist in the last few years.

Stealthfully concealing a sister division's rolling stock underneath your own battle crest is a shell game familiar to car marketeers worldwide. Could it be possible to get much more mileage out of GM's J-car? Not likely; all five divisions sell it, ranging in price from $6976 for Chevy's coarsest-cloth Cavalier to a cool $13,332 for the ultra Zoot-suited Cadillac Cimarron. And Chrysler's K-platform in stretched and tweaked form birthed most of the fwd-ness coming out of Lido's shop.

But wait! The shell game recently crossed corporate lines. Chevrolet and Isuzu are selling the same Isuzu-built car under aliases; Chevy and Toyota are selling cars, one built in Fremont, CA, the other in Japan, that are more similar than not; Chrysler

The Mitsubishi Mirage (Turbo shown above) and the Dodge/Plymouth Colt (GTS version, below) are one in the same cars.



The Chevy Spectrum (left) and the Isuzu I-Mark (right). Isuzu has positioned the I-Mark slightly above the Spectrum in trim level, but the cars are otherwise identical.

and Mitsubishi are selling two models, identical except for names and badges; and Ford seems set to grab up Mazda 626 production from that company's forthcoming Flat Rock, MI assembly plant. Ford's already sells Mazda-built models under its own badges in the Far East.

"What we're seeing these days is just the tip of the iceberg; there's going to be a lot more [badge engineering], and at the lower end there's going to be very little differentiation [between carlines]," says George Peterson, director of Automotive Programs at J.D. Power & Associates, a marketing information firm.

Chevy/Isuzu/Toyota

Peterson makes an important distinction: most intracorporate mirror marketing attempts involve low-line cars. "What we're finding, especially on the low end of the line, is that probably it's right. But when you move up through the line to the more expensive cars, what you're really looking for is a way to more clearly differentiate your product from somebody else's. So then badge engineering doesn't work that well.

"Most of the domestic manufacturers will admit to you, right to your face," continues Peterson, "that if it were not for the CAFE [Corporate Average Fuel Economy] regulations they would not be producing anything smaller than middle-sized cars in the United States.

"You figure that the smallest car Ford would produce here would be the Taurus/Sable; the smallest car that General Motors would produce here would be an A-car. Everything else would be offshore.

"You have several manufacturers out there that are capable of producing more cars than they can sell. That includes Mitsubishi, that includes also a lot of the Korean companies, in fact all of the Korean companies. And probably several other Japanese companies. I would not be surprised to find Nissan producing cars for other people. They already produce the Volkswagen Santana in Japan."

If battle lines have been drawn between Chevrolet Spectrum and Isuzu I-Mark dealers, Chevy apparently hasn't noticed. "It's very simple," states a Chevrolet spokesman, "the numbers of dealers are in our favor. When we go nationwide in the fall [with the Spectrum] we've got 5200 dealers. That's the main point right there. A lot of Chevrolet intenders will have never even heard of the Isuzu I-Mark.

"Your I-Mark intender may be lured into a Chevrolet dealership knowing that the Spectrum is coming in," the Chevy man says. "And it's the same car but it's got the backing of the Chevrolet dealership and the Chevrolet network across the country. We don't even have to market the Spectrum, and we're not marketing it against the I-Mark. It's more that we ignore the I-Mark than anything else. I don't know what Isuzu's going to do, but we don't have that problem."

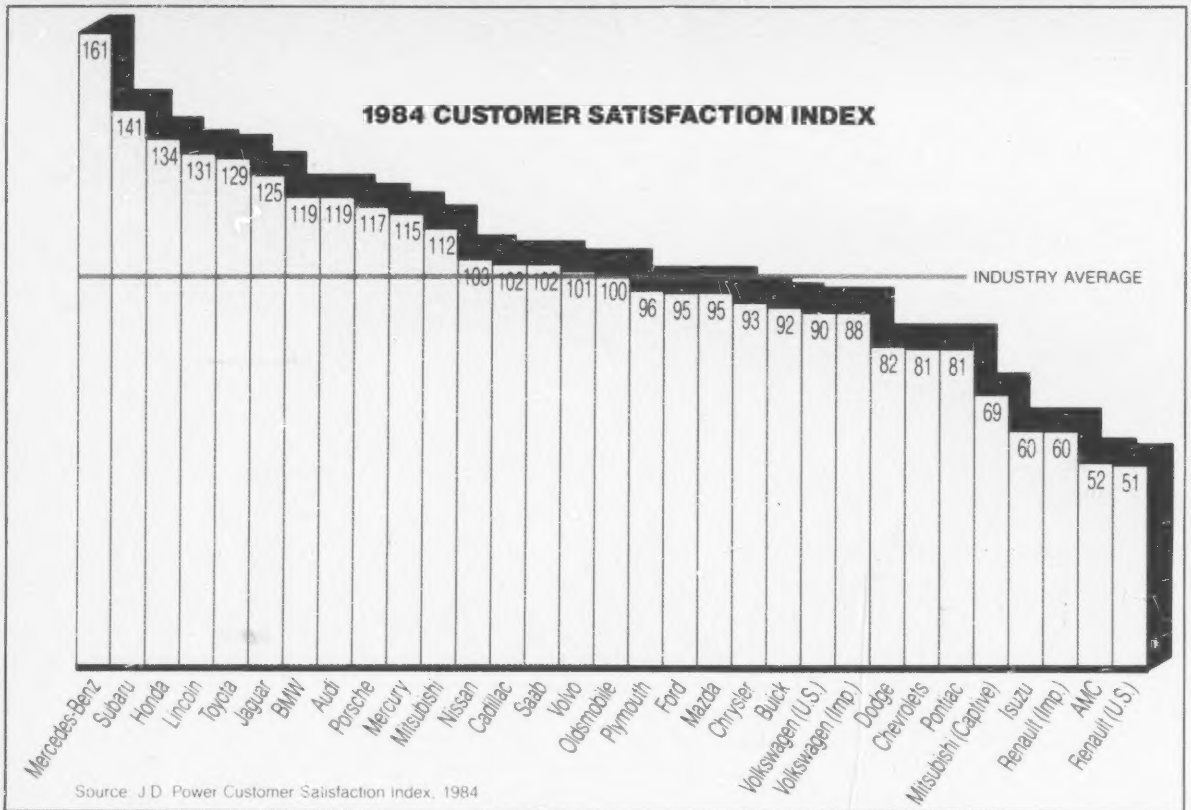
Meanwhile, over on the other side of the playing field: "The problem that Chevy faces that they're trying to avoid," an Isuzu spokesman explains, "is that if you get a four-door, heavily optioned vehicle, that thing is going to cost as much as basically an entry-level Celebrity or something. And then, you know, Americans buy cars by the pound or by the size; and it's going to be a tough sell. This guy's got a $9500 Spectrum on the floor, and a $9500 Celebrity. There's a pretty good chance Fred and Alice Six-pack are going to go to the Celebrity."

Is Isuzu worried that the sheer volume of Chevy dealers—the largest dealer body in America—might hurt Isuzu dealer sales? "Well, they haven't had a sheer volume of Spectrums yet," says the spokesman.

A Dealer Game

Says J.D. Power's George Peterson, on how you go about selling badge-engineered cars though different corporate dealer networks, "It really becomes a dealer game at that point. Who has more dealers, who has stronger dealers, who has better dealer representation. Certainly Chevrolet can sell all of the Suzuki Cultuses or Chevrolet Sprints that they can get. Suzuki will be bringing in their own product very shortly, the Cultus. And you better believe that Chevrolet will be able to sell a lot more of those then Suzuki would. So it really has to do with giving your dealers a wide enough product range that a customer can just walk into your dealership

(Continued)



Source: J.D. Power Customer Satisfaction index, 1984

J.D. Power's 1984 customer satisfaction index reveals that people who bought their cars from Mitsubishi dealers were, as a whole, more satisfied with their vehicles than people who purchased Mitsubishis from Dodge/Plymouth dealers (see Mitsubishi Captive listing). The chart also reveals that people who bought Chrysler Corp. domestic products were more satisfied than those who purchased Chrysler's captive imports.

and pick out exactly the car that they want. Whether or not its a Chevrolet built by Suzuki in Japan, or whether it's a Chevrolet built by Isuzu in Japan or built by Toyota in Fremont, California."

Toyota Concerned?

On any rivalry between Toyota and Chevrolet over the NUMMI-built Nova, Peterson says, "Toyota seems to be concerned. They're really interested in the price point that Chevrolet's going to be selecting for the Nova [*base price is $7195, with the average-equipped model going for about $8800, according to Chevy. The base price of the fwd Corolla sedan is just under $7000—ed.*]

"Toyota themselves have a very strong dealer body, but it's about 1/5th the size of the Chevrolet dealer body. The concern there, is that Toyota has been in a sort of low supply/high demand mode over the course of the the last three to four years that the restraints have been in place. They haven't really had to sell their product. So Toyota has been demand-driven rather than supply-driven.

"There's a question there about the possibility of the Nova in the hands of Chevrolet winning the battle against the Corolla in the hands of a Toyota dealer who hasn't been having to bite and scratch for every sale."

A Chevy spokesman comments, "The Chevy dealer network is the biggest one around. And this has always been a problem with people buying imports when they get outside the big urban area, except in California, and the car breaks down. What happens? You wait for parts, you wait for this, you wait for that. There have been a lot of studies."

Chryslubishi

The most overtly badge-engineered cars currently on the US mirror market are the Chrysler Colt/Mitsubishi Mirage hatchbacks and the Chrysler Conquest/Mitsubishi Starion sport coupes. All four cars are built by Mitsubishi and differ only in nameplate and minute trim details.

Chrysler isn't trying to camouflage the origin of its imports. Instead, according to Darryl L. Davis, Chrysler's general manager of import and export operations, the company is pulling its Oriental offerings out of the closet for good. Advertising copy touts the cars as being "All The Japanese You Need To Know," and subtle "Imported for Dodge, Built by Mitsubishi" badges adorn both vehicles.

[*Mitsubishi officers in Japan declined to answer marketing questions submitted by* AI.—*ed*].

And in facing the Colt and Conquest models off against their Mitsubishi brethren, Davis claims his division's mirror marketing is simply taking advantage of the different

The Deja vu Two: Chrysler Conquest (left) and Mitsubishi Starion.

mindset, tastes and buying habits which separate import and domestic car buyers. Many salespeople agree.

"The US and foreign car buyers are a totally different breed,"says Jack Reis, sales manager for Dover Chrysler-Plymouth in Rockaway, NJ.

"The foreign car buyer that comes in here—we try to switch him into an American car and he doesn't want to know anything about it," says Reis.

Reis says that neither the domestics' 8.8% financing nor the 5/50 warranty sway the buyer who comes in intent on landing a Japanese Chrysler.

"He came in looking for that car, and he's gonna buy nothing *but* that car," Reis explains. "Foreign car buyers will pay $1000 over sticker and then tell everyone how wonderful the car is."

Davis says Chrysler's import strategy complements its domestic sales, but some dealers wonder if the company isn't sending potential buyers into the Mitsubishi camp with its "All The Japanese You Need To Know" sloganeering.

"Half of them come in with brochures from Dodge which is right across the street," one New York Mitsubishi sales manager told *AI*. "What we've heard from most of the customers who come to us who went in to buy, say, a Conquest is that the Chrysler/Dodge salesman would try to push them into one of their own cars first. Then as a last resort, if the customer insisted they wanted the Mitsubishi they'd sell them the Mitsubishi. They [the Chrysler dealership across the street] don't *get* as many [Mitsubishi-built cars] as we do, so their supplies are more limited, their color choices are more limited. They'd rather sell their own cars."

Chrysler: 'Buy Japanese'

"As a Mitsubishi dealer we just use this as another example of why to buy Japanese," explained an East Coast Mitsubishi sales manager who requested anonymity. "You've got Chevrolet and Toyota married together; Ford and Mazda, Mitsubishi and Dodge/Chrysler. The American car manufacturers are *telling* you to buy Japanese—because even *they* are buying Japanese."

Could this be the beginning of internecine warfare among the pentastar partners?

"I don't see that Mitsubishi is really a competitor of mine," states Davis confidently. "They've been regionalized because of their volume, and their marketing strategy has been one of single-line dealers in metropolitan points. They have 82 dealers and I've got 4000—that really doesn't pose any big threat to me," he says. "We probably compete more with Nissan, Honda and Toyota."

Why would a car shopper choose a Colt over a Mirage, a Conquest over a Starion—or vice versa? Chrysler and Mitsubishi dealers list Chrysler's overwhelming dealer numbers, Mitsubishi's factory-trained mechanics and even Lee Iacocca as factors—as well as vehicle availability.

"It's six-of-one, half-a-dozen of the other," exclaims Mike Marenzi, sales manager for Alhambra Dodge in Alhambra, CA. "Sometimes you can sell them [Colt shoppers] an Omni. We'd like to see more Colts; it often depends on how many comparable American cars we have—it's all on availability."

Rockaway (NJ) Mitsubishi sales manager Bill Catlin concurs, and claims he has to compete with Chrysler's Omni-Horizon twins as well as Colt. "If supply is there, it's no problem," he says. "We have a small number of dealers compared with Chrysler, but it must be tough on Chrysler too. What does a Chrysler dealer get—two [imports] a month?"

Customer Satisfaction

According to the 1984 J.D. Power survey (see chart), there's a big difference between the two badges in customer satisfaction. Mitsubishi owners buying from Mitsubishi dealers are much happier with their cars than are their Chrysler/Mitsubishi-buying counterparts. Although this survey covered only the 1983 model year, in which there was no model overlap between the companies, it points to a wide perception disparity between owners of cars built by the same company and sold under two different emblems.

The two long-time partners are certain to become increasingly competitive with one another in the last half of the '80s. No one *yet* is saying "This town ain't big enough for the both of us." Are both companies set to continue on separate marketing tracks with identical products?

"There probably could be a lot more positive joining of efforts—and we could probably help each other more than we do," says Chrysler's Davis. "From a marketing perspective as far as the cars are concerned I would think that both distribution channels could do certain things that would work in concert to enhance both of them and not tread on them."

By agreement, no dualed Mitsubishi/Chrysler dealers exist today. But if they did, how would a sales manager pitch identical cars under different badges from the same store?

"I'd put all the Mitsubishi cars together with their badges on one side and all the Chrysler cars together with their badges on the other, says Rockaway Mitsubishi's Catlin. "Because it's the image they present that's important, not the final product. It's the corporate image of each."

"You could stick a Japanese nameplate on a trashcan and people would buy it."—Jay Vollweiler, sales manager at New Rochelle Dodge, New Rochelle, NY. ■

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T&OHI NEWS

Hino Claws For National Medium Sales

by Douglas Williams

Hino has landed in the US for real, taking its three very recent medium-duty trucks nationwide, according to John Hanrahan, sales and marketing VP for the company. All diesels, the trucks range in GVW from 25,500 to 30,000 lb (*11,500 to 13,600 kg*) and in horsepower from 160 to 200. (See TOHI, April '85, "Invasion of the HD Market Snatchers," p. T-9).

All the Hino newcomers are cabover-engine (COE) straight trucks in the range of Class 6.

The engines are offered in both turbo and naturally-aspirated versions. Interestingly, Hino also will offer a Cummins B-Series diesel.

"We're pragmatic about the US market," Hanrahan says. "We think we can get additional sales with Cummins availability."

Initially, the Cummins powerplant will be offered only in the FE model, a 25,500 lb GVW straight truck with hydraulic brakes.

The company expects to have 65 dealers in the US by year end and has set 135 as the number it ultimately wants in the continental US, and another 45 in Canada.

"Hino is the largest medium and heavy truck maker in the domestic Japanese market and the second largest in the world," Hanrahan claims. "We have got a particular challenge here in having a different name than Toyota—the other truck makers have carmaker names," Hanrahan says, noting the difficulty in marketing an unfamiliar Japanese trucks-only marque in the US.

"These trucks went into regular production in Japan in 1981," he explains. But "there was a great deal of attention given to make them adaptable to the US market. Our initial vehicles met the California emissions requirements immediately, something the European trucks didn't do."

Hino reports it first recieved EPA engine certification 12 years ago.

The design of the current generation of Hino US-spec medium-duty diesel trucks got underway in 1977. They were introduced into five southern states in January 1984. ■

Modular Approach To Instrumentation

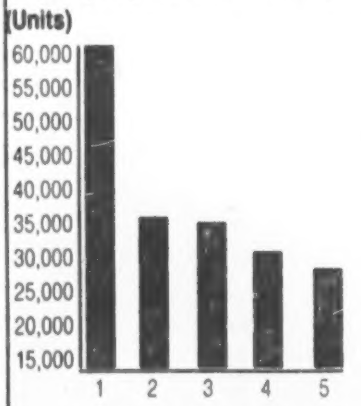
by Peter J. Mullins

Seen at the recent SITEV show in Geneva was a unique modular instrumentation system aimed mainly at low-volume vehicle builders (truck and off-highway), but also offering volume carmakers a flexible system for special models.

Automotive and Industrial Systems Ltd., Dyffryn Industrial Estate, Ystrad, Mynach, Hengoed, Wales, has devised a Lego-like modular system of tough plastic blocks which are locked together with simple wedges. A vehicle manufacturer can build up a complete display to his own requirements using either conventional electro-mechanical instruments or the latest vacuum fluorescent/liquid-crystal types—or a combination of the two. There are two basic module sizes. Advantages claimed are negligible tooling costs compared with traditional package instrumentation, ease of installation and much simpler servicing. ■

FYI: WORLD HEAVY-DUTY TRUCKMAKERS '84

Five Largest Heavy Truckmakers (Weighing 32,000 lb or more)



1—Mercedes+F'Liner: 61,100

2—Volvo/White: 36,100

3—IH: 36,000

4—Paccar: 33,400

5—Mack:27,700

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PIRELLI UNBAGS SUPER TIRES

While total tire sales in Europe are expected to stagnate between now and 1990, super ultra-low profile radials are booming. Pirelli forecasts that with turbocharging and multi-valve technology now common, the carmakers fitting ULPs as standard will double.

by Peter J. Mullins

Pirelli has drawn back the curtain on two new super tires which the company claims represent a major advance in high-speed tire technology. Known as P600 and P700, the tires are in effect a second generation of the ultra-low profile (ULP) P6 and P7 tires launched in the mid-'70s.

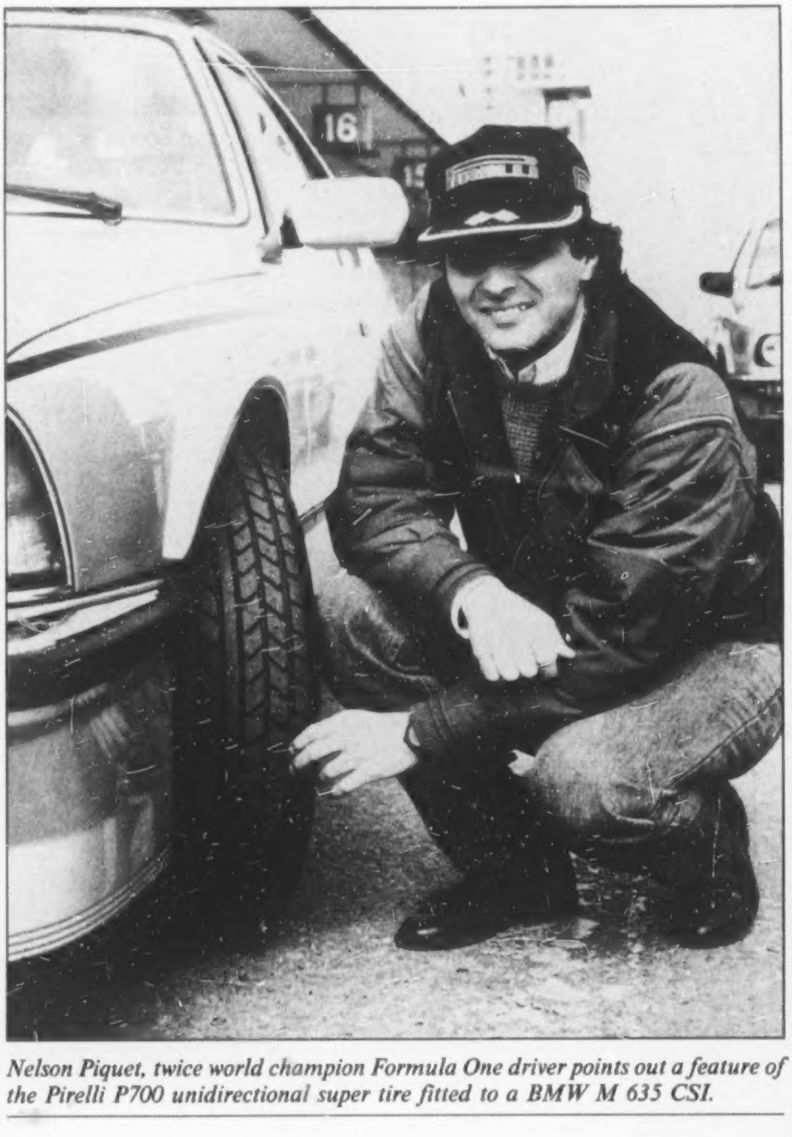
Notes F. Semin, technical director of Pirelli's car tire division: "We believe the P700, the higher performing of the two, is the highest-performance road car tire in the world today. It has been [approved] by Porsche already and will be fitted as original equipment to the German manufacturer's whole product range—including the 944 Turbo—from August 1985, the start of the 1986 model year. It will eventually replace the P7.

"The P600—aimed at cars like the Golf GTI and Saab 9000 Turbo—will be sold in parallel with the P6, which Pirelli currently supplies as original equipment for over 70 cars made in Europe, the US and Japan."

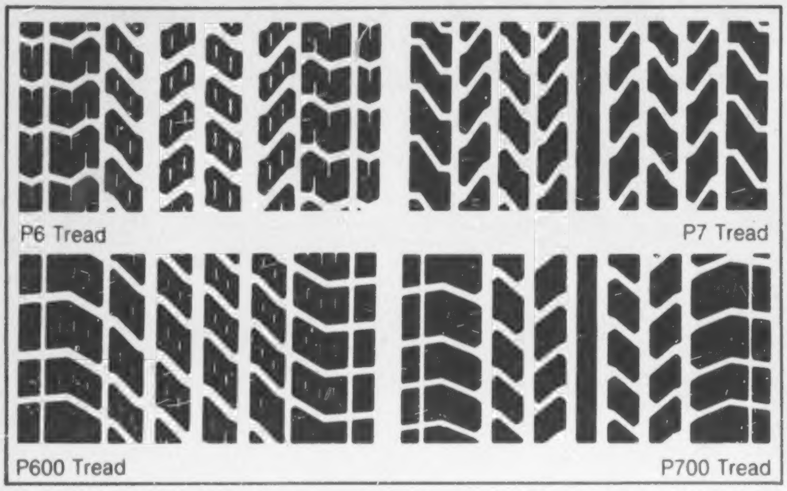
Jotters Judge Tires

Journalists were able to try out the new tires for themselves on the twisty Jarama racing circuit just north of Madrid. Part of the track—including two sharp bends—was flooded to test aquaplaning resistance. Cars available included: a couple of BMW M 635 CSis, a Porsche 911, a Porsche 928S (all fitted with P700s), some of the new turbocharged Saab 9000s, a collection of Golf CTIs, Peugeot 205 turbos, Renault 5 turbos and a few Ford Escort XR3s; these latter equipped with P600s.

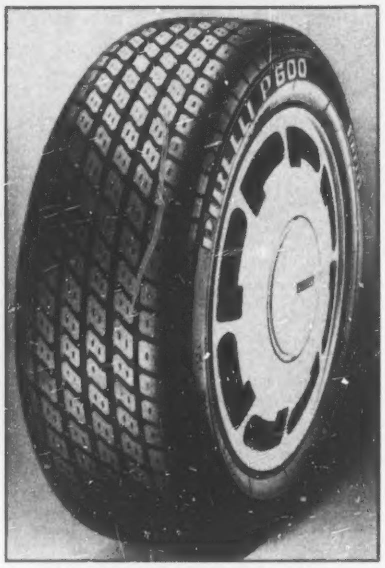
Performance was impressive. Although a true test would have been to test each car first with P6s and P7s and then switch to the second-generation equivalents so a comparison could be made, it was still obvious



Nelson Piquet, twice world champion Formula One driver points out a feature of the Pirelli P700 unidirectional super tire fitted to a BMW M 635 CSI.



The P600 and P700 tread patterns (below) with the P6 and P7 tread patterns. The new treads were designed using computer-aided design and advanced experimental techniques.



Pirelli's new P600 tire can replace P6s on a number of GTI and turbocharged production cars. The tire offers considerably better performance. Unlike the P700, the P600 is not unidirectional.

World Tire Market ($30 Billion Total)

Segments	
Car	46%
Truck	32%
Van	16%
Agriculture	4%
Motorcycle	2%
Distribution	
North America	40%
Europe	29%
Japan	11%
Latin America	9%
Other	11%

that the new tires represented a new dimension in cornering power. Even when hitting the flooded portion of the track halfway round a bend at high speed, the tires gripped the road with little more than a twitch or two.

Pirelli's figures show that both supertires exceed their predecessors' performance levels in wet and dry handling, resistance to aquaplaning, mileage and noise. The P700, for instance, shows a 20% improvement in roadholding on dry surface and 10% in the wet. Overall track performance is up a startling 40% and mileage in severe driving conditions is increased 50%.

Equivalent improvements for the P600 are less marked. Roadholding up 10%, and mileage uprating 10%. Aquaplaning resistance is increased 15% for the P700 and 6% for P600.

Revolutionary Construction

In both cases, Pirelli has revolutionized the construction of the tires. On the P700, engineers decided on a two-ply carcass of slightly-crossed cord with a cushion of rubber compound in between them—a new tire industry technique. The way this unusual structure functioned under severe driving conditions was monitored using finite element analysis. Over the carcass, the P700 uses two belts of rubber-covered steel cord and over this two further belts of rubberized high-modulus nylon capable of maintaining its strength at temperatures up to 120°C (*248°F*). The rigidity of these two nylon belts is said to have an important influence on the tire's dimensional stability at maximum speed. Pirelli engineers say they have tested the P700 at speeds up to 200 mph (*320 km/hr*) and recorded dimensional growth of only 1.5%—appreciably less than contemporary tires.

Tread Differences

Finally the tread. This is unusual in that the pattern is directional and the tire can be put on in only one way. This argues the need for well-trained service personnel in the field, but since the market is highly specialized, Pirelli see this as no great drawback. The overall objective was to achieve the best configuration for roadholding in controlled power drift conditions and high aquaplaning resistance.

The P600 is more conventional in tread configuration because of the tire's different market requirements. It is not directional. The carcass comprises a single layer of rubberized cord, with two rubberized steel belts and then two wraps of rubberized high modulus nylon. The P600's tread pattern was designed entirely by computer and has a void ratio of 37%, a percentage selected by Pirelli engineers to match with the new multi-polymer compound derived from the P700.

Last but not least, great attention has been paid to noise generated at high speeds and the P600 is said to be 3 dBA quieter than the P6. A similar noise reduction for the higher-rated P700 is 2dBA. ■

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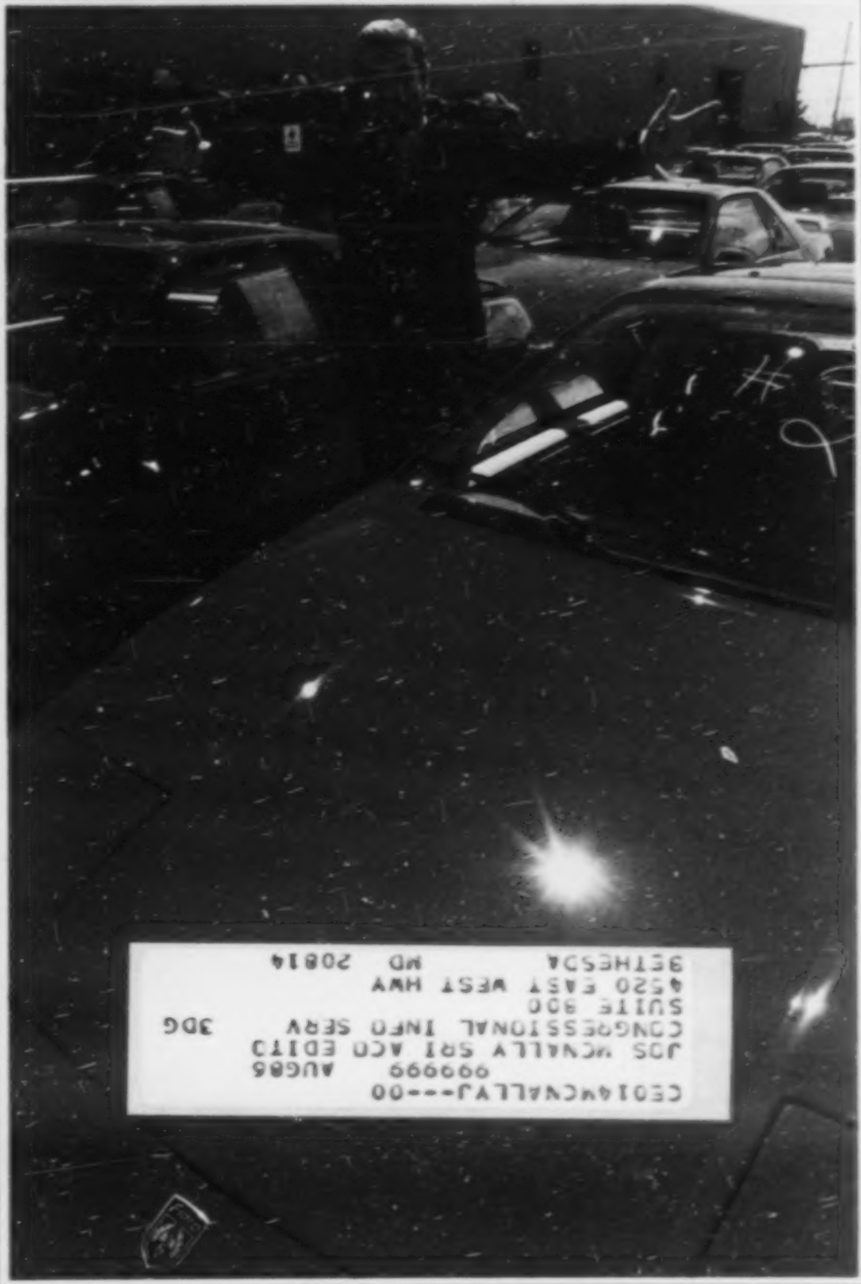

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Boom Times For Galvanized Steel

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COVER

Hulki Aldikacti standing among the revolutionary plastic-bodied cars he helped create at the Pontiac, MI Fiero plant. Photo by Ed Noble.

NEXT MONTH

New Cars '86: The guts, the glamour, the glory—the goofups. Also: What Engine Where? and all the new cars Europe has to offer.

QUOTABLE

"Y'all go back where you came from, we don't need you down here."—spoken by a housewife in a passing car in Spring Hill, TN, during GM's announcement that Saturn would land there.

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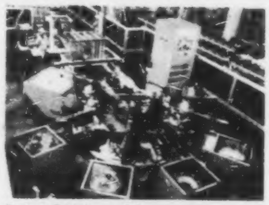
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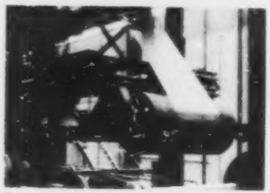
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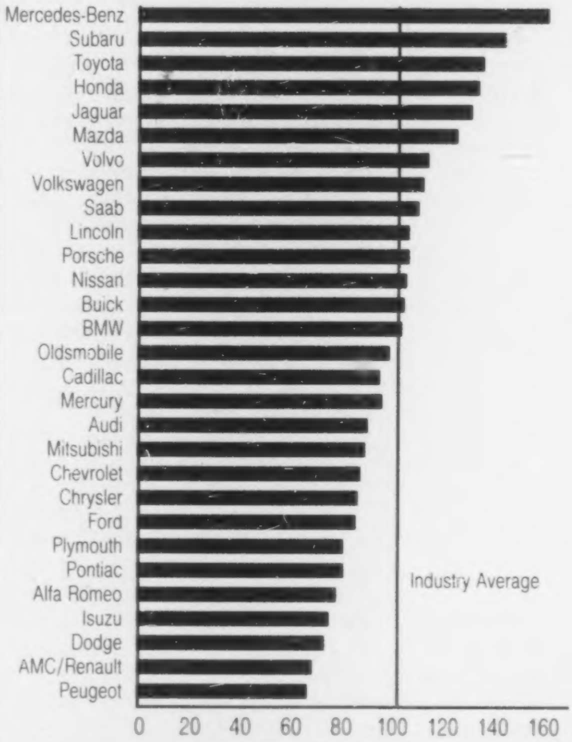
I Can't Get No...

Satisfaction. Dramatic gains by five automakers and a number of disappointing ratings drops by others are revealed in the 1985 Customer Satisfaction Index by auto market analysts J.D. Power and Assoc. And for the second year in a row, Subaru placed second to perennially top-ranked Mercedes-Benz. The annual Power survey queried **'84 model-year new car buyers** 12 to 14 months after purchase on various service and ownership details. This year a bigger sample size—almost 20,000 respondents—gives the survey more statistical validity, allowing market segment and model analysis this time.

J.D. Power 1985 Customer Satisfaction Index



	'85 Index	'85 Rank	'84 Rank
Mercedes-Benz	159	1	1
Subaru	141	2	2
Toyota	136	3	5
Honda	132	4	3
Jaguar	126	5	6
Mazda	121	6	19
Volvo	114	7	15
Volkswagen	112	8	22
Saab	110	9	14
Lincoln	108	10	4
Porsche	108	11	9
Nissan	107	12	12
Buick	106	13	21
BMW	104	14	7
Oldsmobile	98	15	16
Cadillac	96	16	15
Mercury	95	17	10
Audi	89	18	8
Mitsubishi	88	19	11
Chevrolet	85	20	25
Chrysler	84	21	20
Ford	83	22	18
Plymouth	78	23	17
Pontiac	78	24	26
Alfa Romeo	75	25	-
Isuzu	72	26	28
Dodge	70	27	24
AMC/Renault	65	28	-
Peugeot	63	29	-

Interesting factors lurk behind this survey's ratings changes according to George C. Peterson, director of automotive programs for Power. **Mazda**, which rose to sixth from 19th place in '84, did so after exorcising the '83 driveability demons in its 626 and GLC models, says Peterson. **Volkswagen's** climb to 8th spot from 22nd "indicates the company's attention to detail; they really got it right on the last Rabbits," he explains, while noting that quality of US-built VWs is "equal" to that of the German-built Volkscars. The "best attention to dealer training and field service in the US industry" helped **Buick** shoot up to 13th from 21st in '84. **Lincoln** kept its No. 1 position among domestic marques but dropped from fourth to 10th place due, Peterson explains, to fit-and-finish and other early production glitches on the Mk.VII and Continental.

Peterson says that automakers with heavy four-cylinder engine mixes seem to fare poorly, which partially explains **Chrysler Corp.'s** low ratings. However, ChryCo's Mitsubishi **captive import** models, lumped with Chrysler domestics for the first time, pulled the ratings of all three divisions down because of a myriad of service problems. **Ford** and **Chevrolet** ratings are also more service-related, says Peterson, but both contain a wide satisfaction disparity between models: for example, Caprice and Crown Victoria each showed few complaints, while Corvette, Camaro and four-cylinder Mustangs scored poorly due to unsatisfactory service. Finally, Peterson points out that the little things mean a lot—nagging radio problems and sagging service standards hurt **Peugeot**.

INTERNATIONAL/MERGERS

GLOBAL MERGERS NET HARDWARE FOR US; SURVIVAL FOR EUROPE

With the competition mounting and over-capacity endemic, European car and component manufacturers see the answer in more and more cooperation.

The Saab 9000 was the first example of the four-way cooperative agreement between European carmakers Saab, Lancia, Fiat and Alfa Romeo. There are some common parts and the basic design and development was shared.

by Peter J. Mullins

While Ford pioneered the concept of building and marketing cars on a global scale, it's the Japanese who have tweaked the idea to the point that they can, seemingly at will, apply crippling competitive pressures on carmakers in Europe and the US.

Other car producers now realize that they too must become global or die. Hence, the bewildering network of alliances, joint ventures and cooperation agreements which now exist within the global motor industry.

In the US, the tie-ups between GM and, respectively, Toyota, Suzuki, and Isuzu have been more toward supplying product for the booming US market than anything else. And the forthcoming ventures between Mazda and Ford, and Chrysler and Mitsubishi, are also driven by the need for cost-competitive small cars. The link between AMC and Renault, where the French company holds a 46.1% interest in the American automaker, also feeds AMC the necessary capital and technology to build modern cars in the US.

The Continental Difference

In Europe, however, the thrust toward mergers takes on a different focus. The marketplace has failed to fulfill the fond hopes of the '70s. Instead of around 12-14 million cars/year, we are currently seeing a European market of only 10 million. And not only that, European car exports of over 3 million have been halved by Japanese competition and are still dwindling.

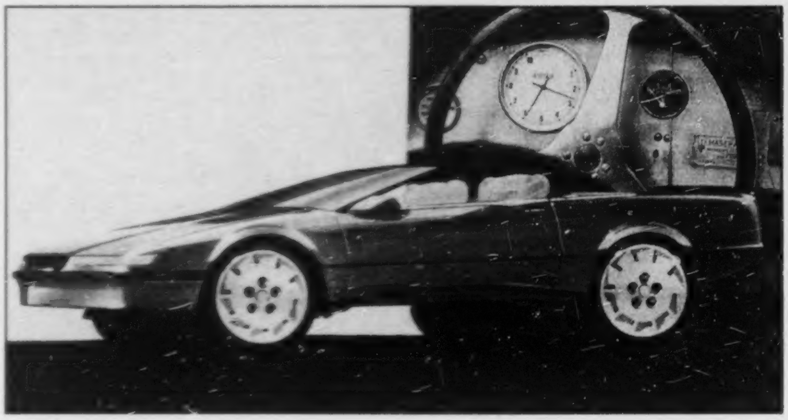
The result is structural over-capacity of something like 20% with severe pressure on profits as carmakers cut prices to preserve market shares. In the 'car wars' of recent years, the six top volume carmakers in Europe have been slugging it out, each with 11-12% of the total market. This leaves them financially weak and in a poor position to find the investment for model replacement.

As Data Resources (DRI) says in its latest World Automotive Forecast: "The European industry needs to respond to the shortened product cycle being adopted by Japanese competitors, where a 4-5 year norm has been established against the 8-9 year cycle still common in Europe."

Deeper Cooperation Needed

What seems obvious is that, as the DRI report puts it, "Joint component development alone will not offer rapid enough savings to head off gathering difficulties. The forms of cooperation [between companies] will have to go much deeper."

Brand-new Lancia Y10 is the first car to use the FIRE 1000 engine, a joint project between Fiat and Peugeot.



Artist's rendition of the joint venture sports car Maserati and Chrysler will build for Chrysler to sell in the US.

It is with this background that the recent news about a tie-up between Ford and Fiat is so interesting. At the time of writing there is no news except that both companies have had teams of experts examining possible areas of cooperation for as long as eighteen months. What Ford would dearly like to do is whittle away some of its less-productive and high-cost capacity but it knows it could run into political storms if it started closing plants in Europe.

This highlights one of the special characteristics of the European automotive scene: the extensive political patronage of 'national' motor companies. Firms like BL in Britain, Alfa Romeo in Italy and, to a lesser extent, VW and BMW in Germany would probably have ceased to exist if they had not been bailed out at some time or another by government (or local government) money.

Thus, commercial logic has been flouted and the fragmentation of the European motor industry perpetuated. The industry is now looking for ways of getting around this problem of fragmentation by combining forces. Part of Fiat's attraction to Ford, incidentally, is that although it is an 'establishment' company, it is wholly private.

Fiat/Alfa Romeo/Saab Link

Among the more imaginative cooperative schemes which have been pursued in Europe is the Fiat/Alfa Romeo/Saab project to provide a top-of-the-range model for each company. Two of these have already been launched—the Saab 9000 and the Lancia Thema. Fiat is announcing its version in the fall and Alfa Romeo next year.

Much of the basic design work was shared and the cars have some common components, but each manufacturer bodies and finishes the car himself with different levels of trim and performance to appeal to different market sectors. So far, the venture has proved a success.

In Europe, the most comprehensive joint venture is the Austin Rover Group/Honda collaboration. This has built up over the years from the Acclaim, a Japanese car built in England under license and with some ARG input, through the Rover 200 series (also a licensing agreement but with considerably more British input and redesign) to the XX model, a car designed from scratch by both companies. The XX will be built in both Honda and Rover versions and marketed alongside each other in all markets, including the two home ones. This is the car which will herald BL's return to the US market.

Recently, both companies announced a further venture, the YY project. In the UK, this will replace ARG's Maestro and, like the XX, will be built by both companies in two versions. This car will also be launched in the US.

There is currently some suggestion that Austin Rover may eventually manufacture some of the Honda models in Britain and this would have the effect of taking up some of the British company's surplus capacity.

The other interesting Japanese/European cooperation in carmaking is the Alfa Romeo/Nissan Arna project. Nissan Cherry (US' Pulsar) body shells are shipped in panel form from Japan to Pomigliano in Italy, assembled and then fitted with Alfa engines and a mixture of other Nissan and Alfa components. Again, the arrangement meets both parties' self interest: the Italian company adds to its range without huge capital investments; and its Japanese partner gains entrance to an Italian market tightly closed to Japanese vehicles.

Nissan also has had an interest in Motor Iberica, a Spanish truck producer and the Japanese company intends to start car manufacturing there in 1987. Production rate will be in the

(Continued)

Japan Not Looking To Southeast Asia for Parts

While many US automakers are looking towards Southeast Asia as a sourcing Mecca, the Japanese auto industry is not likely now or at any point in the foreseeable future to move its sourcing operations into this arena.

Explains Steven Usher, auto industry analyst for Kleinwort, Benson Ltd., "The close-knit nature of the Japanese auto industry combined with the limited production capacity and lower product quality of many of these overseas operations will surely prevent Japanese automakers from obtaining a significant portion of their components from Asia."

Imports of auto parts and components totaled only 63.5 billion yen ($254 million) during 1984, and Nissan alone accounted for nearly 80% of the total. Virtually all of the imports originated in the US and other industrialized countries—which could well be a defensive move on the part of the Japanese industry to avoid protectionist backlash from the US Congress.

8500 Firms Supplying Parts

All totaled, there are an estimated 8500 firms located throughout Japan which are supplying parts and components to the Japanese auto industry. Many of these belong to large corporate groupings. Toyota, for instance, is said to have over 220 parts makers under its control; Nissan has over 150.

More importantly, these firms still account for well over 95% of total parts and components purchased by the Japanese auto industry. In fiscal 1984 (concluded this past March), Japanese auto parts production totaled 6.1 trillion yen ($24.6 billion). Imports, which generally come from the United States and other industrialized countries, amounted to only about 1% of that total.

Unlike the US where in-house production can account for well over half of component requirements, an estimated 70% of Japanese parts production is handled outside. Moreover, supply generally is conducted on a "just-in-time" basis for the purpose of keeping inventories low.

Any attempt to expand parts supply offshore into Asia, states Usher, would not fit well into this structure.

This issue, however, is still largely a non-issue as the components industry throughout much of Asia lacks the capacity to meet even local requirements. One of the reasons cited for Toyota's decision last year to back out of its much-publicized Taiwan production venture concerned this lack of capacity.

For the most part, Japanese parts suppliers have followed their group leaders overseas. Toyota, again as an example, is producing knockdown (KD) vehicles in Indonesia, Malaysia and Thailand. Nippondenso, one of the main members of the Toyota group, also is represented in each of those countries.

Japanese auto parts production totaled $24.6 billion last year. Imports amounted to only about 1% of that total.

Rushing for China

Concerning the broader issue of overseas production, Japanese automakers are well established throughout Asia with operations in Indonesia, Malaysia, the Philippines, South Korea, Thailand and Taiwan. In recent months there has been a rush to gain a foothold in the fast-growing Chinese market.

Of the major Japanese makers, Nissan Motor Co. last year led all other manufacturers in the overseas shipment of KD units.

Top-ranked Toyota also is conducting local production in 20 countries, including Indonesia, Malaysia, Thailand, Bangladesh, Pakistan and, most recently, India.

At present more than 25 local assembly and production operations have been established throughout Southeast Asia, and a number of these date back to the late '50s.

The scale of most of these ventures is rather small, as average yearly production is under 15,000 units. In the recently concluded Japanese fiscal year, KD set exports to the region (excluding CKDs) totaled 257,581 units. While representing 27% of total Japanese KD exports worldwide, the total nevertheless is comparatively small.

"The important thing to keep in mind," stresses Usher, "is that auto production in Asia is not that significant. The market, however, does provide a fairly stable source of growth."

Usher adds that where Japanese involvement exists it will tend to remain mostly in the areas of parts supply and know-how.

"If the Japanese aren't there," he says, "someone else will be. In that sense, they seem to be looking at the market from a long-term perspective."

The Korean Connection

While most Japanese makers have expressed little or no interest in sourcing from Asia, Mitsubishi Motors stands as an exception. The Tokyo-based company, which has been instrumental in the early success of Hyundai Motor Co. of South Korea, providing both technical assistance and production components, has indicated that in the future it may import such components as engines, transmissions and pressings.

Hyundai, in which Mitsubishi Motors and Mitsubishi Corp. combined hold a 15% equity, is the largest auto manufacturing operation in the region.

Largely because of considerably lower wages, A Mitsubishi Motors executive in Tokyo estimates that the landed cost of Korean-made components could be as much as 10% less costly than those produced in Japan.—*Roger Schreffler* region of 40,000 cars/year.

There are numerous lesser deals between carmakers. Volvo and Renault have been associated for some years and at one time Renault had 15% of Volvo shares but relinquished this stake in 1983. However, Volvo's new small car from its Dutch plant is designed on a Renault 9/11 floor pan.

Toyota has a 21.5% stake in Lotus and the two companies are cooperating in the production of a sports car known as the X100 using a Toyota engine. This car will be aimed at the US market.

The Spanish government is negotiating the sale of a controlling interest in SEAT to VW and it is likely that several of the West German company's models will be made in Spain.

VW also has a deal with Nissan for the manufacture and sale in Japan of the Santana (US' Quantum). This venture started in 1980 when VW's US operation was turning sour and Nissan saw the need to defuse trade friction between Japan and Europe, so it tended to be long- term and speculative on both sides.

However, the deal is proving successful and there is now a likelihood that the cooperation could grow into something much wider. Areas of future cooperation could include the Americas, South Africa, and exchange of know-how and joint purchases and/or production of engines, transmissions and suspension systems. It is understood that Nissan has already invited the German company to make the Prairie (US' Stanza wagon) in Europe.

Porsche has designed and engineered a new Russian Lada to replace the old model which was based on Fiat designs. Chrysler and Maserati are associated in a new sports car project. Reliant of the UK is making Ford's new RS2000, a low-volume high-perfor-mance model intended to take Ford back into rallying. And Mazda and Isuzu (respectively partly owned by Ford and GM) have been cooperating with Pol-Mot, the Polish state-owned enterprise to produce a car for the European market.

Nissan builds the Volkswagen Santana in Japan; Volkswagen may reciprocate by building the Nissan Prairie (above) in Germany. The Prairie is sold in the US as the Stanza wagon.

A clear trend over the past few years is the low-cost sourcing of components in countries like Korea, Taiwan and Hong Kong. This will continue. But the same thing is happening with complete vehicles.

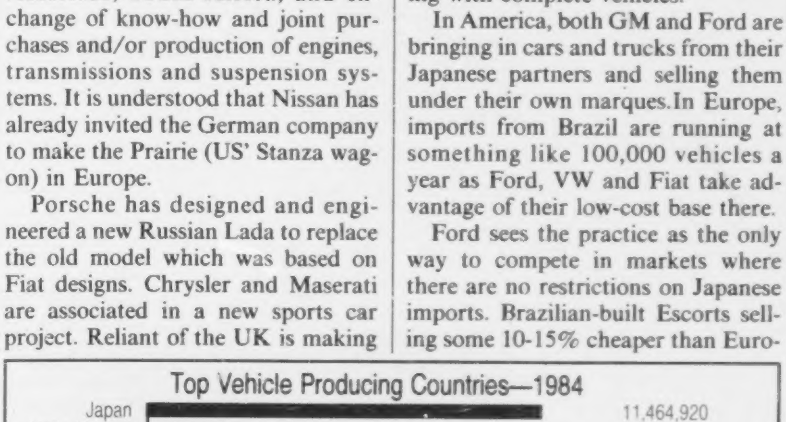
In America, both GM and Ford are bringing in cars and trucks from their Japanese partners and selling them under their own marques.In Europe, imports from Brazil are running at something like 100,000 vehicles a year as Ford, VW and Fiat take advantage of their low-cost base there.

Ford sees the practice as the only way to compete in markets where there are no restrictions on Japanese imports. Brazilian-built Escorts selling some 10-15% cheaper than European-built ones are being applied to Scandinavia and Switzerland and Ford has said that it could bring in cars from its partner Toyo Kogyo in Japan. Ford sells Mazda vehicles under the Ford badge in the Far East.

Fiat imports the 126 model from Poland and engines and some car-derived vans from Brazil. Part of the problem of high imports (57%)—which bedevil the UK market where both Ford and GM have a substantial market share—is that these companies bring many cars in from Spain which still has a high tariff barrier.

Europe is also worried about the possibility of increased penetration from Eastern Bloc countries. Besides the Lada, there is also the Zastava Yugo range based on Fiat designs from Yugoslavia which have been well-received in Europe. Polish/Japanese cooperation could also mean Japanese products coming in through the back door of Europe in countries like Italy and France, where the front door is virtually closed.

From the beginning of the '80s, we have seen this crunch situation building up in Europe and the next few years are going to be fairly critical. What is certain is that the pace of collaboration will undoubtedly speed up and the ventures will be more fundamental than in the past. ■



Top Vehicle Producing Countries—1984

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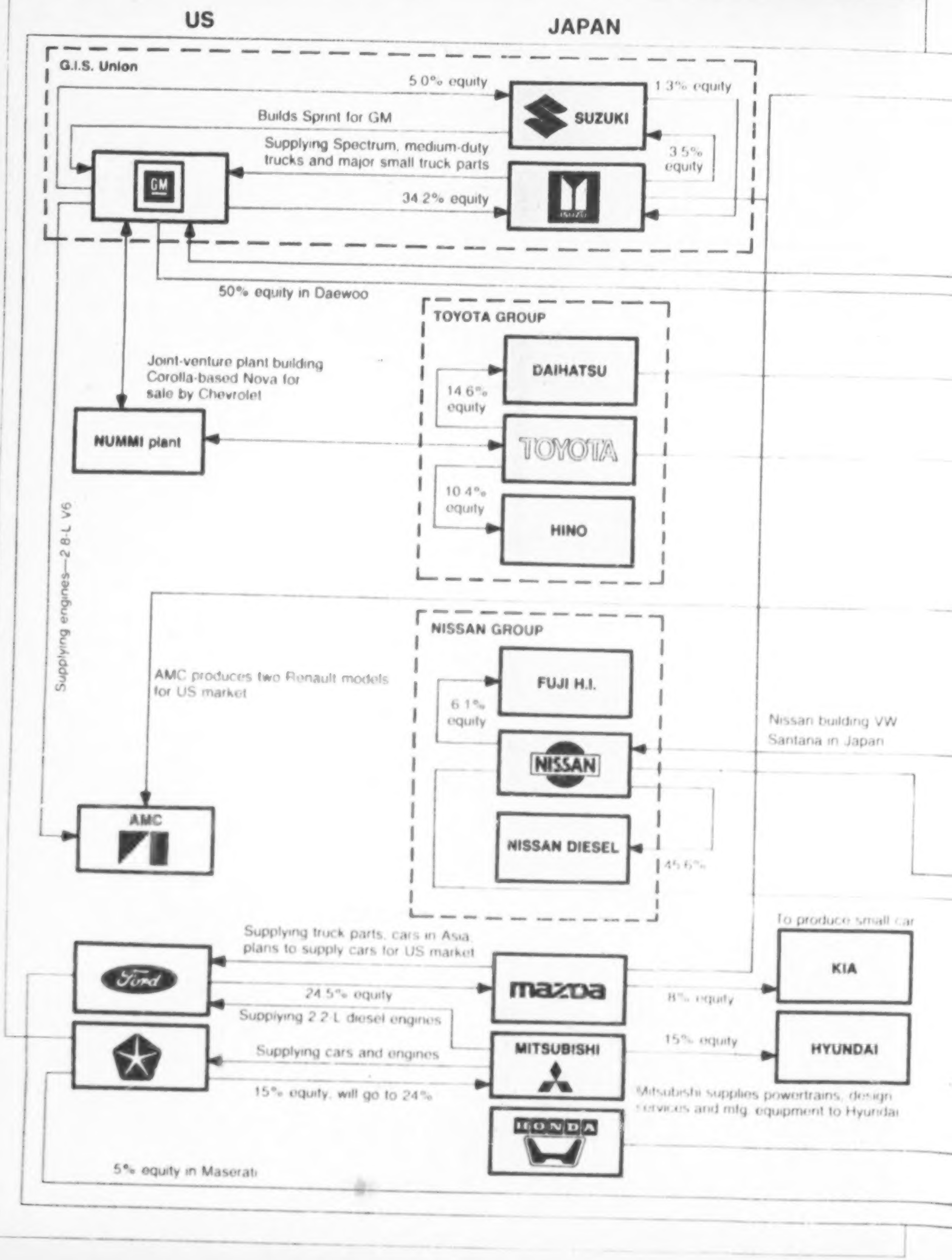
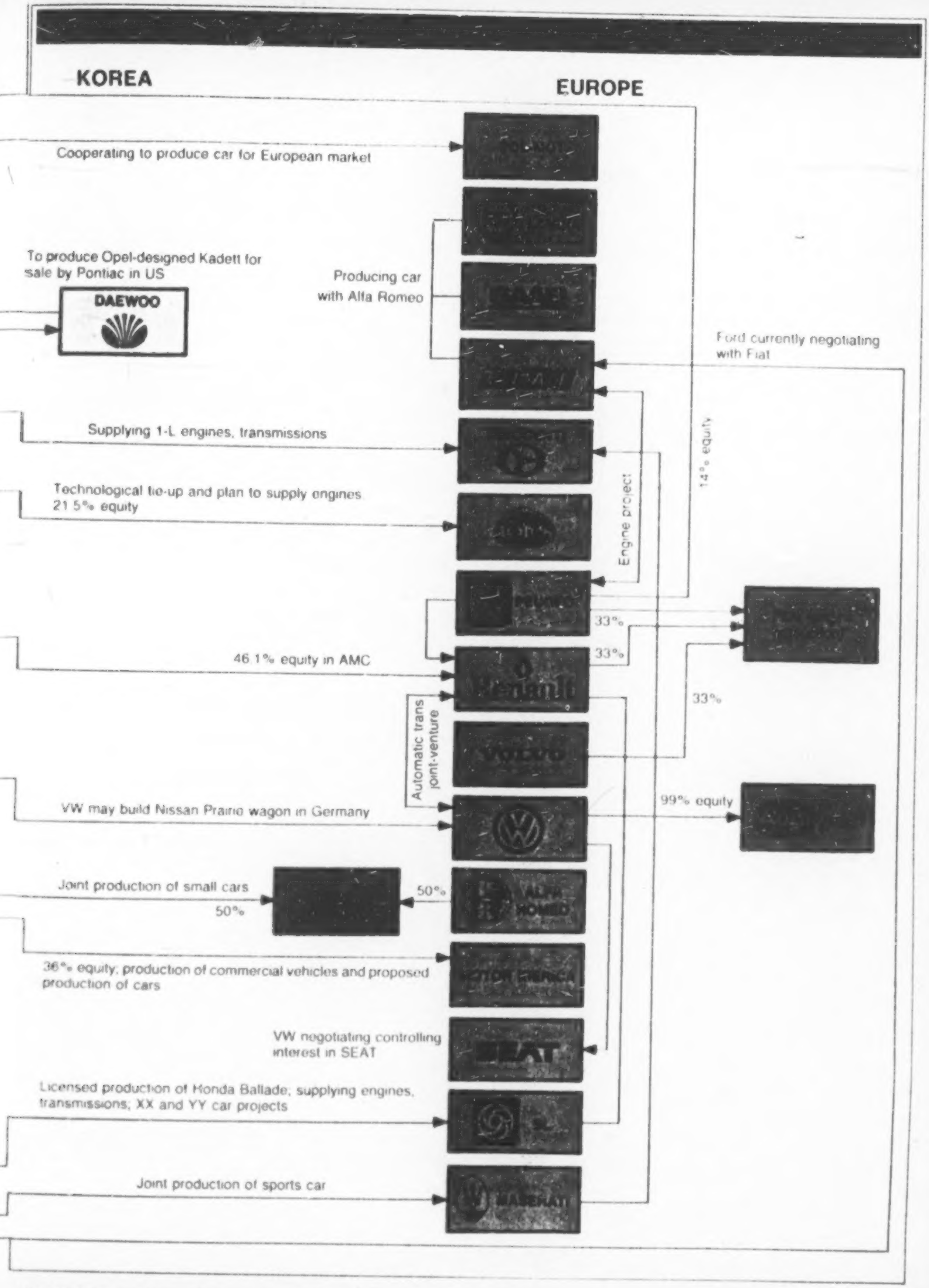
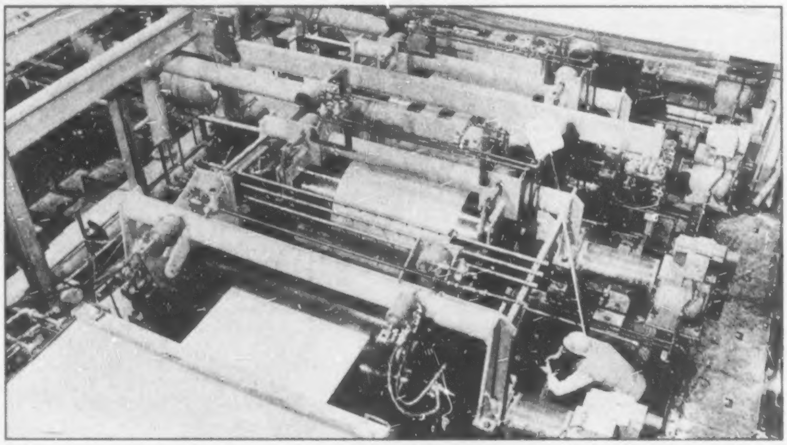
GLOBAL JOINT VENTURES IN AUTOMOBILE PRODUCTION


US
JAPAN
G.I.S. Union
5.0% equity
1.3% equity
SUZUKI
Builds Sprint for GM
Supplying Spectrum, medium-duty trucks and major small truck parts
3.5% equity
GM
34.2% equity
ISUZU
50% equity in Daewoo
TOYOTA GROUP
DAIHATSU
Joint-venture plant building Corolla-based Nova for sale by Chevrolet
14.6% equity
NUMMI plant
TOYOTA
10.4% equity
HINO
Supplying engines—2.8-L V6
NISSAN GROUP
AMC produces two Renault models for US market
FUJI H.I.
6.1% equity
Nissan building VW Santana in Japan
NISSAN
AMC
NISSAN DIESEL
45.6%
Supplying truck parts, cars in Asia, plans to supply cars for US market
To produce small car
Ford
mazda
KIA
24.5% equity
8% equity
Supplying 2.2-L diesel engines
MITSUBISHI
15% equity
HYUNDAI
Supplying cars and engines
15% equity, will go to 24%
Mitsubishi supplies powertrains, design services and mfg. equipment to Hyundai
HONDA
5% equity in Maserati


KOREA
EUROPE
Cooperating to produce car for European market
To produce Opel-designed Kadett for sale by Pontiac in US
DAEWOO
Producing car with Alfa Romeo
Ford currently negotiating with Fiat
Supplying 1-L engines, transmissions
Technological tie-up and plan to supply engines 21.5% equity
Engine project
14% equity
33%
33%
33%
46.1% equity in AMC
Automatic trans joint-venture
VOLVO
VW may build Nissan Prairie wagon in Germany
99% equity
Joint production of small cars
50%
50%
ALFA ROMEO
36% equity; production of commercial vehicles and proposed production of cars
MOTOR IBERICA
VW negotiating controlling interest in SEAT
SEAT
Licensed production of Honda Ballade; supplying engines, transmissions; XX and YY car projects
Joint production of sports car
MASERATI

BOOM TIMES FOR ELECTROGALVANIZED STEEL

The scramble for corrosion protection drives US-based automakers to embrace electrogalvanized steel at a pace equal to US capacity until at least 1990.



National Steel built a prototype electrolytic line in Portage, IN to allow auto companies to test the material it will produce.

by George J. McManus and Bryan H. Berry

The demand for electrogalvanized (EG) steel among automakers in the US will probably match or exceed the available supply until at least 1990, according to industry projections. Some steel executives are predicting a US supply of 4 million tons of electrogalvanized steel by 1990—a figure most automakers say total US auto industry demand will match by then.

Next year the US automakers will demand 2.2-2.4 million tons of EG, forecasts Paul J. O'Hara, Ford's director of metals, petroleum and materials purchasing.

That demand will roughly equal the available capacity of the five new EG lines (see chart) plus the two existing ones.

In interviews with executives at GM, Ford, Chrysler, NUMMI, Nissan Motor Mfg. and Honda of America Mfg., it was discovered that each company plans a different approach to using EG for corrosion protection. The automakers initially plan to use different coating weights, too.

GM's Plan

Of the 7 million tons of steel GM bought for the 1985 model year, about 1.2 million net tons, or 17%, is galvanized. That includes 800,000 tons of two-side hot-dip galvanized; and 300,000 tons of one-side galvanized steel, including 276,000 tons of one-side EG steel. The No. 1 automaker also uses 675,000 tons of Zincrometal.

For the 1986 model year, GM plans to increase its purchases of galvanized steel to 1.3 million tons. GM will use EG steel on all external panels of its new E- and K-cars. The Chevy M-vans use two-side galvanized steel for major body panels.

GM will buy an estimated 11,500 metric tons of hot-dip galvanized steel from Nippon Steel and 10,000 metric tons of EG sheet from NKK. That's because US steelmakers didn't have enough capacity to supply that steel, say GM officials.

GM already has signed long-term contracts with LTV, Armco, Bethlehem and Inland for most of its electrogalvanized steel, said John Debbink, GM's VP of materials management. "Some of those contracts extend into the 1990s," Debbink added.

By the 1989 model year, estimates one GM purchaser, GM will use 1.5 million tons of EG. "We'll buy all two-side EG," he added.

GM presently uses hot-dip galvanized steel for the car parts subjected to road salt, mud and flying objects—rocker panels and many parts not readily visible, including underside structural members. GM coats the hot-dip rocker panels with Plastisol and then paint. In addition, GM has fabricated station wagon tailgates and hatchback lids from ultra-smooth hot-dip products that have a more paintable surface than conventional hot-dip steels.

GM now uses both Zincrometal and EG for most of the exterior body panels that are most visible. These two coatings give a better surface appearance than does hot-dipping.

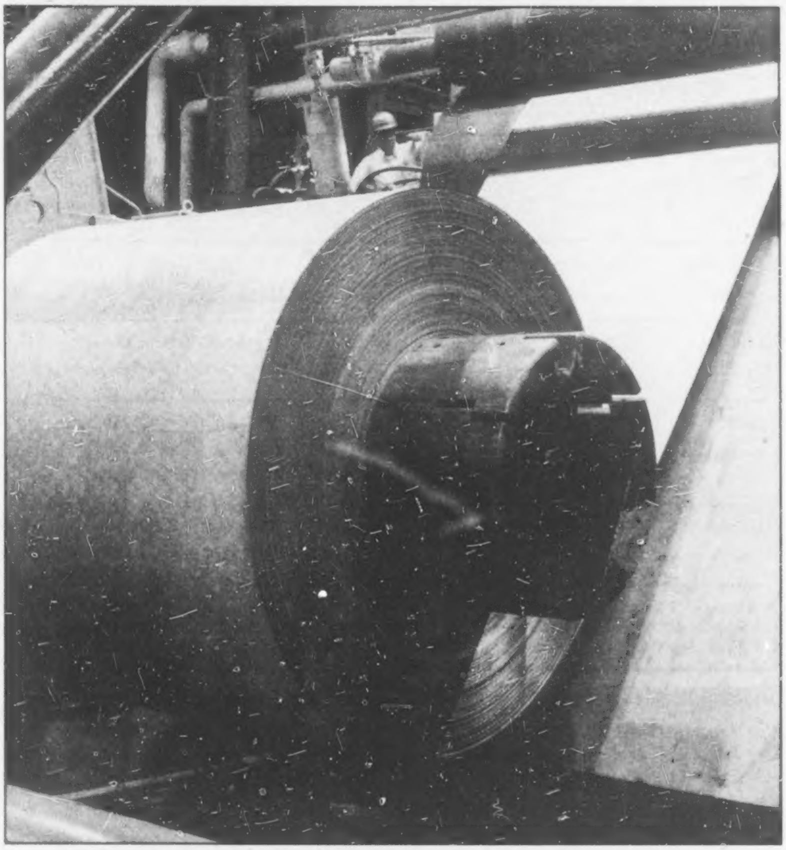
Automakers say that the roof, exposed to the least corrosive forces, is the only body panel that doesn't need the extra corrosion protection of EG.

As EG capacity comes on-stream in the US, GM plans to phase out its use of Zincrometal and completely replace that with EG. "By 1990 all the Zincrometal will be gone," predicted Gerald W. Ropers, director of body systems at C-P-C.

The automakers are trying to decide how much zinc coating each exterior panel needs. The different body panels likely will get different coatings, depending on how much they're subjected to salt and mud.

"Common sense tells us that we don't need as heavy a coating on the deck lid as on the quarter panel," said C-P-C's group director of operations, David Campbell. "But nobody has proof of that.

This is an abridged version of an article that first appeared in *Chilton's Iron Age*.



One-sided galvanized sheet at National Steel's Midwest Plant. In March, National unveiled a prototype electrolytic line at Midwest Steel.

"The test time for galvanized steel has been so long that we've tended to overkill with heavier coating weights than are needed," said Campbell. "We'll adjust our coating weights as we get information from the field." The dilemma Campbell refers to is important: Automakers aren't sure that laboratory corrosion tests accurately reflect real-world corrosion.

GM presently uses one-side EG with a zinc coating of 90 g/m² on the inside of body panels. But as the automaker discusses EG capacity with the steelmakers, GM is basing its predictions on two-side EG steel with 70 g/m² of zinc both inside and outside.

"We have enough experience with EG now that we can say that EG with the 90 coating weight is good for the life of the vehicle," said Campbell.

"We might continue using coating weights of 90 g/m² for the quarter panels," said E. H. Klove, Jr., director of paint systems in C-P-C's manufacturing engineering group. "But we'll probably use lighter coating weights around 70 g/m² for parts where corrosion isn't as severe a problem."

Ford to Drop Zincrometal

In the 1985 model year Ford used 490,000 tons of galvanized steel and 350,000 tons of Zincrometal. Total steel purchases by Ford vary between 1.6 and 2.5 million tons, depending on the number of vehicles the company produces.

For the 1988 model year the company plans to use 972,000 tons of galvanized steel and zero tons of Zincrometal. Of that 972,000 tons, said Paul J. O'Hara, Ford's director of metals, 680,000 tons (70%) will be electrogalvanized and 292,000 tons (30%) hot-dipped.

"The big jump in electrogalvanized usage will occur in the 1987 model year," said O'Hara.

Ford plans to buy EG from all five of the new lines. Rouge Steel, a subsidiary of Ford, will supply one-third of the automaker's galvanized steel. Ford has been buying one-side EG from US Steel's Erie, PA line and will continue to do so.

Ford buys about 5% of its steel from overseas; about half of that comes from Japan. Nippon Steel, Nippon Kokan, Kawasaki, and Sumitomo are the four Japanese steel suppliers, in order of tonnage shipped to Ford.

"We buy coated steel, cold-rolled steel, and Zincrometal from Japan for three reasons," said O'Hara. "(1) Some of the steels are available only from Japan. (2) We want to keep in touch with their technology. And (3) their cost is often better than here." He expects Ford to continue buying about 5% of its steel from overseas after the 1987 model year.

Ford is specifying EG coating weights of up to 60 g/m² on each side. Hot-dipping is less costly for weights above 50 g/m², the company presently believes.

Initially Ford plans to use no galvanic coating on the outside of exposed body panels. "We don't think we can paint over the zinc and get the surface appearance we want," said O'Hara. "Most of our exposed panels will use the one-side EG steel. The two-side EG will be for interior parts like floor pans and inner panels for the hood, doors and deck lid. Most of those two-side steels will be differentially coated."

Ford will rely on the integrity of its paint system to protect the outside of the car from cosmetic corrosion. For all the automakers, the adhesion of the electrocoating and phosphates to the inside of the body panels is critical to corrosion resistance. Most of Ford's exposed body panels are Zincrometal now.

Even if Ford initially uses only one-side EG for exposed body panels, it's fair to assume that it will at least consider using two-side EG there later. The Rouge EG line can coat two sides. Ford is the one of the Big Three planning to use one-side EG for exposed panels.

Chrysler Coats Heaviest

Chrysler plans to use EG steel on all exterior panels except the roof.

(Continued)

WHO'S DOING WHAT WHERE IN ELECTROGALVANIZING

	LOCATION	ANNUAL TONS	COST (MILLIONS)	SUPPLIERS
National Steel	Great Lakes	400,000	$70	Nippon Kokan (Process Tech) Wean United, Westinghouse Electric—General Electric
U.S. Steel Rouge Steel	Dearborn	560-700,000	$130-$150	U.S. Steel (Carosel Tech) Wean United, Kawasaki
LTV/ Sumitomo	Cleveland	500,000	$125	Sumitomo (Process Tech) Mitsui & Co., Aetna-Standard
Armco	Middletown OH	200-400,000	$50	Arus Andritz-Ruthner (Wet Process) Stamco, Allen Bradley, Westinghouse
Bethlehem/ Inland	Waldbridge OH	400,000	$80	Arus-Andritz-Ruthner (Wet Process)

All lines are 72 inches wide and all are due to start in the first half of 1986. Not shown are existing lines of Sharon Steel or the Gary Works of U.S. Steel. A prototype line is operating at the Midwest plant of National Steel. Bethlehem has converted a tinning line at Burns Harbor.

Chrysler's Joe H. King, manager of metallurgical engineering, will go even further. "In general terms, in my judgment, every panel except the roof on every car built in this country will have electrogalvanized on the outside," he says.

Initial plans at Chrysler specify the heaviest interior EG coating of any US automaker: Chrysler wants 100 g/m^2 of zinc on the inside and 25 g/m^2 on the outside.

The 25 g/m^2 coating of zinc on the car's exterior won't hurt the paint appearance, said King. "Chrysler successfully has painted two-side hot-dip steel on exposed body panels in the past," he said. "That shows we can paint over galvanized steel. The EG process creates no base-metal roughness that would degrade the appearance of the painted surface."

Chrysler's interior unexposed parts presently have minimum coating weights of 100 g/m^2 for each side of hot-dip and 50 g/m^2 for each side of galvannealed steel. "We don't expect electrogalvanizing to be competitive at those coating weights," said King. "But if EG proves to be economical and there's enough left-over capacity, we'll consider using it for unexposed parts."

NUMMI Buys from Japan

New United Motor Manufacturing, Inc. (NUMMI), the GM/Toyota joint venture in Fremont, CA, buys 3500 tons of steel per month. A little more than half that comes from Japan. Nippon Steel and Nippon Kokan supply the galvanized steel; Sumitomo and Kobe, the cold-rolled. Nippon, NUMMI's largest steel suppliers, supplies NUMMI with all its electrogalvanized steel.

"Except for the roof, all our exposed body panels are electrogalvanized steel," said Stephen R. Coletta, NUMMI's materials purchasing manager.

NUMMI's Nova uses the same steel specs as the car on which it's based, the Toyota Corolla Sprinter. So far, the EG steel Toyota has bought is coated on one side.

"Toyota feels that Americans use too heavy a coating weight on their electrogalvanized steel," explained Coletta. "Americans tend to use the same coating weights established for the hot-dip product. But EG doesn't require that thick a coat.

"As the new EG products are developed, the cry goes out: Use two-side EG everywhere. That's a knee-jerk reaction and not cost-effective."

The one-side EG that Nippon ships NUMMI has a coating weight of less than 25 g/m^2 on the inside. The hot-dipped product from NKK has double that.

NUMMI uses the same EG coating weight for all the exterior panels, including the doors, fenders, hoods and rocker and quarter panels. But as the new EG lines come on-stream, NUMMI may buy different coating weights for different exterior panels, predicted Coletta.

NUMMI buys somewhat less than half its total steel tonnage from one US source: LTV, which supplies just cold-rolled steel. LTV's performance has matched that of the Japanese, said Coletta. He estimates that there's a 10% penalty in cost and quality in US vs. Japanese steel.

The steel from LTV has had some problems in transit; LTV and NUMMI are developing new packaging. The Japanese steel is shipped to NUMMI's Fremont, CA plant in steel canisters.

When the new EG lines start up next year, NUMMI will evaluate data on the products' cost and quality. "We're not anxious to buy US EG unless its cost and quality is as good as those of our Japanese sources," said Coletta. "On the other hand, it is our longterm policy to find US sources for the parts we're presently buying from Japan."

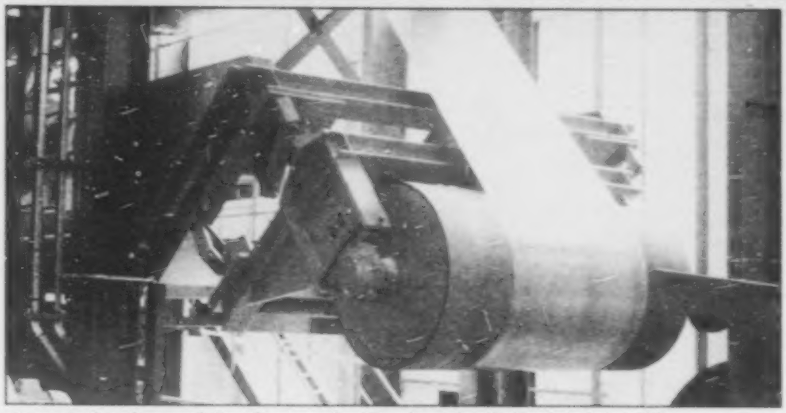
But any new supplier of parts to New United first must undergo a one-year evaluation process by Toyota Motor Co. Toyota, which is responsible for the design of the Nova, makes sure that the new supplier's parts are cost-effective.

Honda Goes Inland

Honda of America Manufacturing Inc. buys 90% of its steel from Inland, its only US source. The company buys terneplate and hot-dip galvanized steel from Japan.

Honda presently is conducting an extensive six-month test program to choose a second steel source. The steel-selection committee hopes to make a decision by the end of this year or, at the latest, before April 1986. That's when production of the Civic starts up in Honda's Marysville, OH plant.

The automaker has eliminated Rouge and Weirton from its list of candidates for a second source of steel. Still being considered: US Steel,



Automotive demand for electrogalvanized steel will hit 2.2-2.4 million tons next year, according to Ford Motor Co. Steelmakers are building five new EG lines to meet the continued bullish demand.

LTV, Bethlehem, Armco and National.

"Inland has some problems but meets our needs," explained Darryl Shown, manager of purchasing at Honda of America Manufacturing. "We have no plans to use electrogalvanized steel, but we'll consider using it."

Nissan Tries Different Tack

Nissan Motor Manufacturing Corp. USA, in Smyrna, TN presently uses 800 tons per month of coated steels for its trucks. Most of that is one-side Zincrometal from Nippon Steel and Sumitomo.

None of Nissan's steel is galvanized. And alone among the eight US automakers (the six described here, plus American Motors and Volkswagen of America), Nissan USA has no plans to consider use of standard electrogalvanized steel.

Instead, Nissan next year plans to replace more that half its Zincrometal with steel that has a zincnickel bonding—electrolytically applied—and then a zinc-rich paint layer over that. Nissan currently is evaluating Kawasaki's K2, Nippon's Welcoate-2 and Sumitomo's SL, all of which fit that description.

"This second-generation material goes a step further than electrogalvanized steel," said Frederick F. Sommer, VP of engineering and planning at Nissan MMC USA. Tests at Nissan in Japan, said Sommer, have shown that this painted, plated steel resists perforation better than does EG steel, particularly after welding.

"We'll use the second-generation steel on the critical panels most subject to corrosion," said Sommer, "such as the fenders, quarter panels and truck side panels."

In March, Nissan began manufacturing the Sentra at Smyrna, all the stampings of which are made in Japan. But at the time of model changeover within the next two years, said Sommer, Nissan likely will buy some dies and use them in their current presses to stamp car parts in Tennessee, too.

If the plated and painted Japanese steel proves a big success at Nissan next year, will that make obsolete all the just-new electrogalvanized lines? Probably not, say most automakers.

"The Nissan approach sounds too expensive," said a purchaser at NUMMI. "Sure, we could have more corrosion resistance than we do now. But we don't think it's cost-effective."

Executives at GM echoed those sentiments. "We don't need an additional layer of paint over the electrogalvanized steel," said C-P-C's Campbell.

On the other hand, if Nippon, Kawasaki and Sumitomo deliver their plated, painted steel at attractive prices, the American electrogalvanizers could paint their own electrogalvanized steel. So far, however, most American automakers still think that standard electrogalvanizing is the state-of-the-art, cost-effective way of preventing car rust—and they expect electrogalvanizing to retain that status until 1990.

By the end of the decade," said Robert McBride, president of National Steel, "galvanized will account for 60% of the steel purchased by the [auto] industry, about 40 million tons."

Mystery Entry

A mystery entry in the galvanizing picture is the joint venture of Wheeling-Pittsburgh Steel Corp. and Nisshin Steel Co., Ltd. The coating line proposed by the two companies for Follansbee, WV, will be of the hot-dipped rather than the electrolytic variety.

An SAE paper given by Nisshin recently indicated the hot-dipped product would be for automotive use but for functional components rather than body sheet. The paper dealt with the performance of aluminized sheet in auto exhaust systems.

The coating project was put on hold after the bankruptcy of Wheeling-Pittsburgh. A separate subsidiary of the two companies will operate the facility and it's possible the court will allow the work to proceed.

Weirton Steel Corp. has no plans for building new electrolytic capacity. The company feels the market will be more than satisfied with the lines now under construction.

"It will be pretty well saturated," said David Gould, Weirton's VP for sheet product sales.

Weirton is probably less dependent on the auto market than other sheet producers. The company is supplying some hot dipped galvanized steel to the auto industry. This is for functional applications and has a heavier coating than is applied by electrogalvanizing.

Weirton is following the electrolytic programs and suspects capacity will be available at other mills for coating on a toll basis. The company has its own electrogalvanizing line but the coatings applied are lighter than what the auto plants require.

However, Weirton was recently licensed to produce GALFAN, which is coated with 95% zinc and 5% aluminum-mischmetal alloy. ■

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Incentives Kick Small Car Sales

by Thomas F. O'Grady

Sales incentive campaigns are the sales success story for 1985. Chrysler's reduced financing program has been running since February 14th. AMC has the longest running finance program and both manufacturers have expanded the range of cars covered since the programs were initiated. Ford and GM added their programs in late February and March, respectively, as both manufacturers felt the need to maintain market share in the small and compact segments.

At large expense, the manufacturers are boosting sales with significant reductions in finance rates. Declining interest rates were not increasing sales sufficiently. The special rates at approximately five percentage points below market are lifting sales.

The key question is whether or not the manufacturers will reinstitute or continue special financing when the programs expire. They probably will. The success of these programs and the increase in Japanese competition and penetration will force a continuation of aggressive marketing. Only AMC's program does not seem to be aiding sales. As a result of the Teamsters truckers' strike, new programs may be postponed, but they are inevitable.

In the small segment, special 8.5% financing as well as dealer incentives have not been able to stop the AMC Alliance/Encore sales decline. Model year sales of these two through July 20th totaled 96,507 compared to 138,272 units last year. It should be noted that sales of these models during the first three months of last year were helped by sales incentive campaigns, but the incentives a year ago were mild compared to the long-running reduced rate financing currently available.

AMC is suffering from problems that the financing program won't help (See *AI* April, "First Annual Industry Report Card", p. 22).

Chrysler's Omni/Horizon models benefited from both the special financing and free transmission packages. For the entire sales campaign (January 30 to April 30th) Omni/Horizon sales were 57,151, a 45% increase over last year 39,369. They are now running considerably lower with the expiration of the incentives.

Chrysler model year share of the total market through the third 10-day selling period in July equaled 13.8% compared to 11.9% a year ago. Chrysler's increase has come largely at the expense of GM, which has seen its market share drop to 55.9% on a model-year-to-date basis from 59.4% a year ago.

In response to the successful campaigns at Ford and Chrysler, GM started its financing campaign on March 20th. Cavalier sales were strong as the availability of special financing boosted volume through April by 62% over the same period in 1984 (56,816 units versus 35,102 in 1984). Between March 31 and April 30th, Cavalier supply dropped from 40 days to 21 days supply. The supply was too low to support a further financing campaign.

This generally improved level of sales has helped GM regain some market share lost earlier in the year. For the month of April, GM's share of the domestic market equaled 57.2% compared to the 55.0% in March when GM's incentives began.

Other GM models with improved sales during this same period as a result of financing incentives are the Pontiac Sunbird and the Olds Firenza (sales up 47%). However, the Buick Skyhawk did not significantly increase its sales volume during its campaign. This may partially be the result of Buick keeping the X-car (Skylark) in its lineup, unlike the Pontiac and Olds divisions. The Skylark has posted strong sales volumes this year.

Ford introduced 8.8% financing on the Tempo/Topaz models in the compact segment from February 22 to April 22nd. For the period, Tempo/Topaz sales were up a significant 83% over the same period a year ago. Since incentives ended, these models are running considerably behind a year ago.

Incentive campaigns are not likely to end soon. The domestic manufacturers need to remain competitive with the Japanese importers, whose stocks increased during May, June and July.

The economy has not been strong. This, together with the increase of 450,000 Japanese imports and the US startup of Hyundai of Korea, should lead to some pretty stiff competition among the small and sporty car segments. In the near term, as competition heightens, look for more market campaign activity and specially packaged cars with fewer options and lower prices. ■

Big Four Incentive Programs

AMC	8.5% 2/1–3/31	
Chrysler	Omni/Charger 8.8%[1] Horizon/Tursimo 1/20–4/30 Lebaron GTS/Lancer 8.8% 4/26–on	Aries/Reliant 8.8% 7/8–7/31
Ford	Tempo/Topaz 2/22–4/22	Escort/Lynx 5/3–6/3 All 8.8% Continental/Mk. VII 5/3–6/10
GM	8.8% 3/20–4/30 J-cars, Fiero	9.9% 6/21–7/31 Electra/98/DeVille

[1] Daytona/Lazer added 2/14

NOTE

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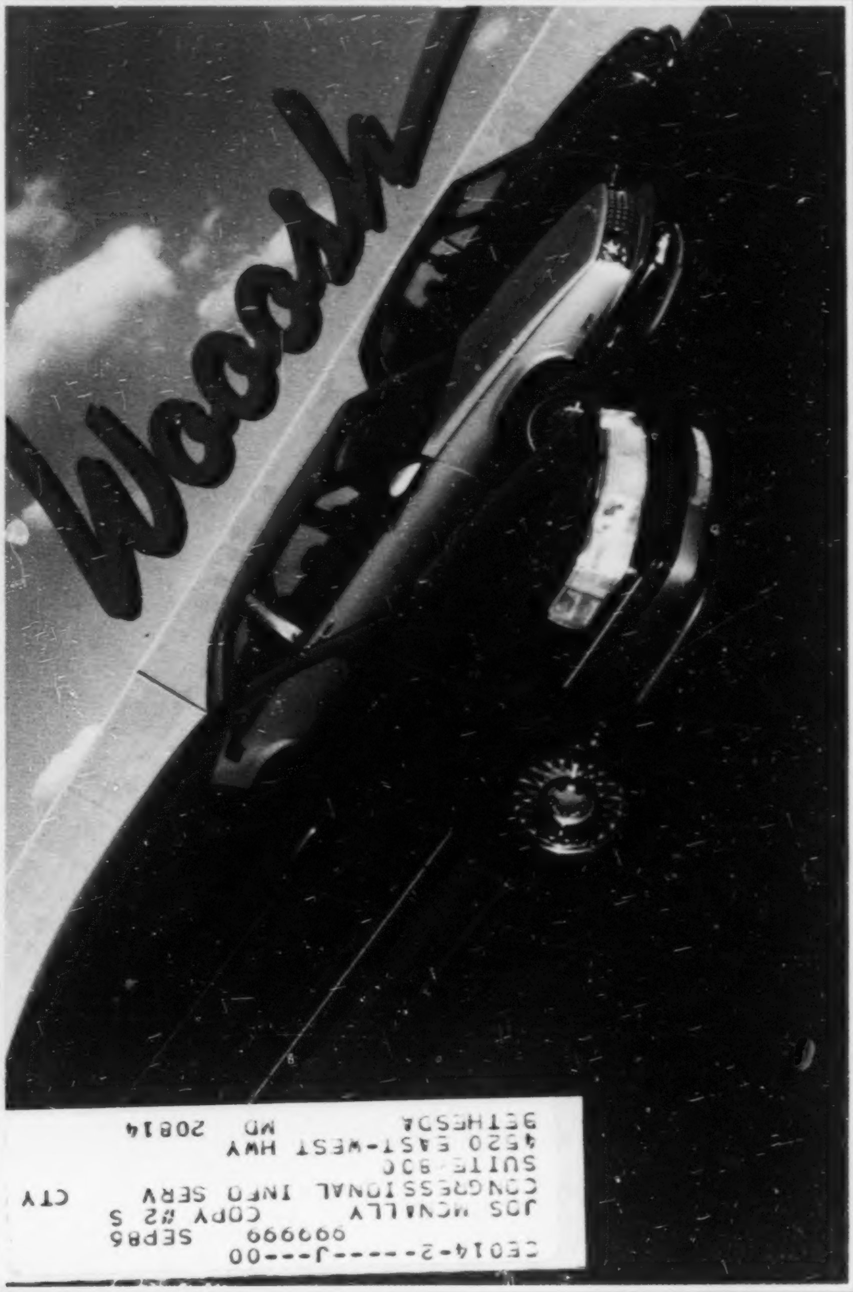

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GM shrink-wraps Riviera/Toronado and brown-shoes LeSabre/Delta 88

Ford tones down Taurus/Sable

Chrysler waits for '87

Toyota front-drives the Celica

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COVER

Bottom to top: Mercury Sable; Buick LeSabre; Olds Toronado at the Michigan International Speedway. Thanks to Ford and GM for the cars; MIS for the setting.

NEXT MONTH

Building The '86s: Close-ups the plants and people building the '86 domestics. Plus: Cadillac's future plans in the modern, downsized world.

QUOTABLE

"There's a lot of talk about the latest initiative the Japanese have in terms of opening their market. Since 1980, I believe, this is either the sixth or seventh initiative on the part of the Japanese. And their export trade balance has increased from $2 billion to $50 billion."—Harold Poling, president Ford Motor Co.

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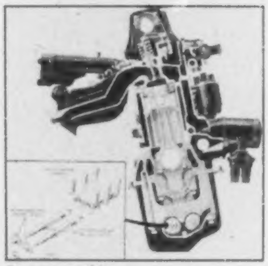

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Japanese Trucks Make US Beachhead

by Joseph M. Callahan

Following on the heels of the European truck manufacturers who are getting established in the US, four Japanese truckmakers—Hino, Mitsubishi, Isuzu and Nissan Diesel—are preparing to assault the $10-billion US medium- and heavy-duty truck business. In much the same manner as their European counterparts, they're starting slowly in the medium-duty market.

The general perception of the US manufacturers is that the Japanese will first bring in their medium-duty trucks to lay the groundwork and establish their reputations. Then they'll introduce their Class 8 trucks in three or four years.

Edward T. Mabley, manager of heavy truck development for Ford Truck Operations, said "It's unfolding like the [Japanese] car thing." He was apparently alluding to the way Japanese automakers began at the low end of the market and gradually added value to their products.

CLASS 4-7 TRUCK IMPORT PENETRATION (1983-85)

	1983	1984	1985*
Mercedes-Benz/ Freightliner	3.0%	2.1%	3.8%
Volvo-White	1.1	1.1	1.1
Renault-Mack	3.1	3.5	4.2
Iveco	0.6	0.7	1.0
GM-Isuzu	0	0.8	1.3
Hino	0	0.2	0.2
Total %	7.8	8.4	11.6
Total Import Sales	7517	10,039	3,595

Source: State Registrations * First quarter of 1985

The Japanese will not have the advantage that Mercedes-Benz, Renault and Volvo have had in "marrying" Freightliner, Mack and White respectively, links which have provided them with dealers for national distribution and service.

As a consequence, the Japanese four are developing their own distribution systems, either by setting up their own small dealer networks or, more commonly, dualing with the domestic dealers of GM, Ford or anyone else. This is illegal in Japan and isn't practiced in Europe or elsewhere.

25% Cost Advantage

However, the Japanese have a distinct cost advantage, estimated by Ford analysts to be about 25%. The US tariff on these trucks is just 4%, compared to 25% for pickups under 8500 pounds (*3855 kg*) The domestic companies naturally are aware of this and have begun positioning themselves to compete with similar low-cost trucks.

Ford Motor Co. is now taking US delivery of the first 35 medium-duty "Cargo" trucks it has been building in Brazil for other markets. Nearly 500 more Cargos are expected to land

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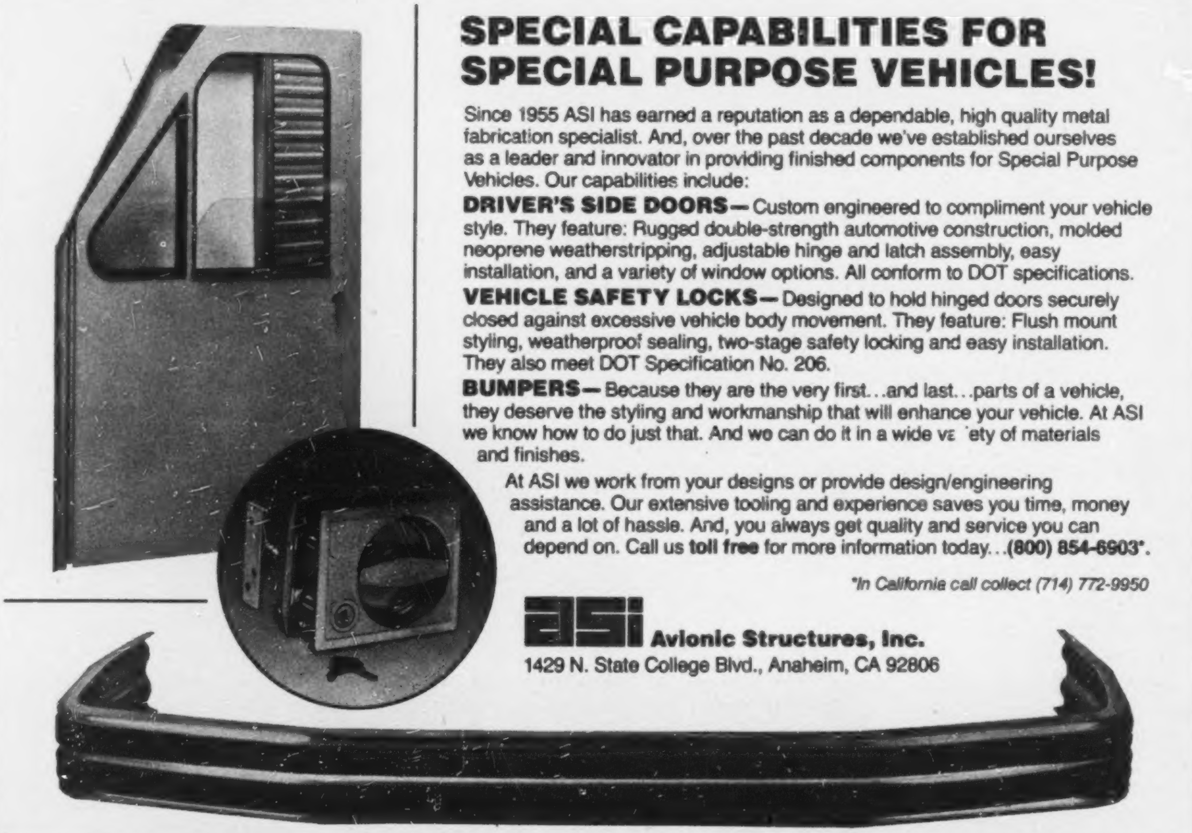

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here soon.

GMC Truck and Coach and Chevrolet have begun marketing a medium cab-over truck from Isuzu which will be sold by its own 103-unit dealer body. And International Harvester has reportedly okayed plans to market Nissan Class 6 and 7 trucks.

Despite all the investing and maneuvering by the four Japanese firms, the above-mentioned European companies, plus Iveco and Saab-Scania, the US medium-duty market is still tranquil because the import numbers are still quite small (see chart).

> **The medium duty trucks will lay the groundwork; Class 8s will arrive in three to four years.**

Based on US registrations compiled by one domestic truck company, the imports only took 7.8% or 7517 units of the 96,371 sales in the Class 4 through Class 7 market of 1983. Import sales increased slightly to 8.4% or 10,039 units out of 119,511 sales in 1984 and comprised 11.6% or 3595 units of the 30,991 total medium trucks sold in the first quarter of 1985.

Making the new Japanese beachhead even more formidable is that they've begun hiring some top-notch American trucking talent. Thomas Reimer is one such executive; formerly vice-president of sales, marketing and product planning at International Harvester, Reimer is now with Hino.

Mabley said the importation of trucks into this country is also being accelerated by a lowering of truck shipping costs as a result of the use of larger and more efficient ships.

Tariffs Lower

Strangely, it's cheaper to bring a fully-assembled truck into this country than it is to import a completely knocked down (CKD) or semi knocked down (SKD) truck. Compared to the 4% tariff on a complete truck, the SKD tariff is 10% and the CKD tariff varies from 15 to 18%. ★

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